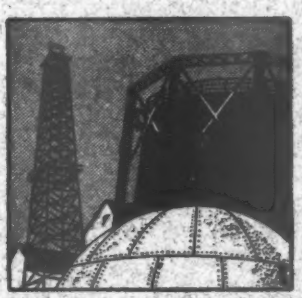
AMERICAN GAS ASSOCIATION MONTHLY



Modern Weathermaking
MARGARET INGELS

Gas—the Key to Smokeless Cities
GUSTAV EGLOFF

The Trend of Rate Structures in the United States
PAUL RYAN

Atlantic City Again to Welcome A. G. A. Members

Hot Water and Health
W. H. REDDEN, M.D.

Winning Mrs. Consumer With Demonstrations
MABEL CLAIRE ATWOOD

Investigation of Bottled Gases At A. G. A. Laboratory

August, 1930

"Water Heating"—Newest Book in Industrial Gas Series

A REFERENCE book on the application of gas to water heating, with special reference to large volume hot water uses, is now ready for distribution by the American Gas Association.

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"Water Heating" is available at one dollar and fifty cents ($1.50), to members of the American Gas Association.

It is equally valuable for complimentary distribution by gas companies to plumbers, architects, and contractors, consulting engineers and builders. Every gas company should supply the prominent members of these professions with copies of the book.

"Water Heating" is one hundred and twenty-eight (128) pages, 9 x 11 inches, with fifty (50) tables, twenty-seven (27) charts and sixty-five (65) illustrations. It is bound in metallic covers of unusual attractiveness.

Send your order now to the American Gas Association, 420 Lexington Avenue, New York, N. Y.

AMERICAN GAS ASSOCIATION MONTHLY

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VOLUME XII — AUGUST, 1930 — NUMBER 8

CONTENTS

	PAGE
Our Own Who's Who—Edwin Ruud	334
Atlantic City Again to Welcome A. G. A. Members	335
Gas—The Key to Smokeless Cities GUSTAV EGLOFF	336
Columbia Offers Graduate Courses in Fuel Technology J. J. MORGAN	338
Modern Weathermaking MARGARET INGELS	339
Brooklyn Gas Engineering Course Enters Fourth Year	341
Winning Mrs. Consumer with Demonstration Teas MABEL CLAIRE ATWOOD	342
Hopkins Offers Innovations in Gas Engineering Course	344
A Prize-Winning Paper—"My Company's Contribution Toward Improvement of Home Life" MRS. MARION CROAL	346
Natural Gas Production Economy J. FRENCH ROBINSON	347
Hot Water and Health W. H. REDDEN, M.D.	349
Gas-Fired Boiler for Asphalt Handling J. B. NEALEY	352
Impressive Award of McCarter Medals	354
Trend of Rate Structures in the United States, 1925-1930 PAUL RYAN	355
Affiliated Association Activities	359
Convention Calendar	360
Personal and Otherwise	362
Investigation of Bottled Gases at Laboratory	364
Aids in Merchandising GEORGE E. WHITWELL	368
Industrial Gas Bibliography	369
Prize-Winning Window Displays	372
Monthly Summary of Gas Company Statistics PAUL RYAN	377

The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein.

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OUR OWN WHO'S WHO

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Edwin Ruud

EDWIN RUUD, pioneer in the automatic gas water heating field and founder of the Ruud Manufacturing Company, Pittsburgh, Pennsylvania, is a native of Norway, but became a citizen of the United States in 1887. He came to America after equipping himself as an expert machinist following his graduation from the Hortens Technical College. His first job in America was that of a machinist with a manufacturer of machine tools. Later he joined the Pennsylvania Railroad Company and was employed in the engineering office of the car building works at Altoona, Pennsylvania.

In 1885, he went to the Reading Iron Works at Reading, Pennsylvania, where he remained until 1887, when he became associated with the Westinghouse interests and was assigned to the Fuel Gas and Electric Engineering Company. It was here that an automatic gas water heater was developed along with other gas appliances for the home and factory. It was several years later that the "Pittsburgh Water Heater," under the Edwin Ruud patents and manufactured by the James Hay Company, appeared.

In 1897, Mr. Ruud, and several acquaintances formed the Ruud Manufacturing Company whose product consisted of two distinct types of automatic water heaters; one known as the automatic storage and the other as the instantaneous water heater.

The underlying structural principles in design and automatic control found in the product at the beginning have changed little in appearance and—with refinements—are found in the product today.

AMERICAN GAS ASSOCIATION MONTHLY

VOLUME XII | AUGUST, 1930 | NUMBER 8

Atlantic City Again to Welcome A. G. A. Members

ATLANTIC City, N. J., will welcome members of the American Gas Association for the third consecutive year when they assemble at that celebrated seaside resort for their Twelfth Annual Convention and Exhibition next October 13-17.

Committees on program, hotel, exhibition, entertainment and transportation as well as many sectional committees now are hard at work in arranging details which will present to the A.G.A. membership a convention and exhibition which promises to eclipse similar efforts of past years.

Again the stage will be set in the great Municipal Auditorium at Atlantic City. While it would seem impossible to improve upon the facilities offered in that vast hall when the A.G.A. met there last year, nevertheless various changes have been made in meeting room facilities and methods of communication which assure greater conveniences and comforts this year.

This will be the second time that the Association has assembled in the municipal auditorium and Convention Hall. For those who were not present last year it may be said that this building emphasizes the utmost in advanced ideas in convention hall construction, furnishings and equipment. This huge structure is acknowledged as the world's most magnificent building of its kind.

Last month Association Headquarters distributed to the membership the customary circular giving details of hotel accommodations, rates, etc. This was accompanied by an application form for the convenience of members, who are urged not to delay making reservation of quarters for their stay at Atlantic City.

Atlantic City's hotel facilities are more than ample to house our membership comfortably, but no single hotel has sufficient rooms to take care of more than a small proportion of those who will attend.

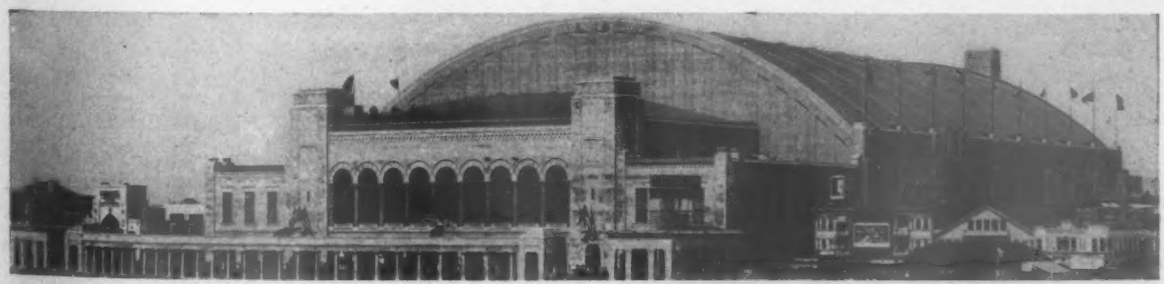
While it is too early to attempt to give anything like a definite outline of the program being prepared, men and women prominent within and without the gas industry have given assurances of their participation, not only at the general sessions but at the sectional meetings as well.

Gas today looms with compelling force in any adequate story of Industrial and Domestic America. It furnishes important copy in the household and popular magazines, technical and financial journals and the daily press.

This condition, in large measure, is due to the recent rapid development of natural gas. Bearing this in mind, all committees handling program details are cooperating with a view of arranging their schedules so that all papers relating to natural gas will be "staggered" in order that representatives of that branch of the industry may have the opportunity of hearing all talks on the subject, as well as to give all delegates an opportunity to visit and inspect the exhibits during the week.

Advance plans indicate that it will

(Continued on page 376)



Atlantic City Municipal Auditorium which again will be scene of the American Gas Association Convention and Exhibition.

Gas—

The Key to Smokeless Cities

THERE is a definite trend throughout the United States toward gas as a fuel to replace coal, use of which is estimated to cost each city dweller $15 a year in damage from soot alone in addition to a general "incalculable detriment to the nerve force and health of the nation," according to Dr. Gustav Egloff, of the Universal Oil Products Company, Chicago, in a paper prepared for the World Power Conference, in Berlin and made public in the United States by the American Chemical Society.

Instead of viewing with alarm the rapid expansion of the gas industry, products of which had a consumer value last year estimated at $500,000,000, American coal producers should begin the installation of processes for the conversion of coal into gaseous fuel and gasoline of high anti-knock value, thus keeping abreast of the newer fuel developments, Dr. Egloff advises.

"The entire replacement of coal by gas is a worthy goal," the report says. "The use of gas means domestic convenience, industrial efficiency, and smokeless cities. The present smoke evil, due to the burning of coal in our cities, is a burden that an enlightened civilization should not tolerate.

"The soot produced in our cities through the burning of solid fuels is a problem of magnitude. It has been stated that smoke causes an annual loss to the United States of over $500,000,000. The average cost to each city dweller due to soot from burning coal is estimated at approximately $15 per year.

"The damage done is of many types. Smoke vastly increases expenditure for laundry and dry cleaning. It impairs merchandise, paint, metal work and the surface of buildings. It adds to the labor of housekeeping, and it is an incalcuable detriment to the nerve force and health of the nation.

"On a purely economic basis, the use of coal in cities cannot be defended. It involves the loading, transportation, unloading, delivering and firing of the fuel, the disposal of ash, the loss of valuable oil constituents that can be educed by carbonization, and the adding of tremendous amounts to the cleaning bill of cities.

"In the use of fuel in the United States a change is occurring that is truly revolutionary. In home and factory alike, tremendous quantities of gas are replacing coal. More than 2,800 billion cu. ft. of gas were consumed in the United States during 1929. Of this quantity, eighty per cent was natural gas, petroleum, still gas and cracking process gas—all products of the petroleum industry.

"The 1929 production of natural gas and refinery gas is estimated at 2,320 billion cu.ft. Much of this gas came into direct competition with coal. In fact, the amount consumed as fuel has a heating value equal to ninety-two million tons of coal. The natural and petroleum gas consumed in the United States for fuel purposes was in that year equivalent to one-sixth of its coal production.

"By far the most abundant of industrial gases is natural gas. This almost invariably accompanies petroleum underground, and infrequently occurs alone. The gas may be present in the earth apart from the oil strata, or it may be dissolved in the oil under the high-pressures which exist in oil fields. These pressures range from a few hundred to above 2,500 pounds per square inch. When oil is produced, gas usually accompanies it in amounts ranging from 200 to 20,000 cu.ft. per barrel of oil. Some wells have produced 100 million to 150 million cu.ft. of natural gas per day.

"Natural gas is carried throughout the United States by a system of widely distributed pipe lines. The total length

Dr. Gustav Egloff

of these lines is estimated at over 55,000 miles, and their value makes up a large share of the present investment in the natural gas industry of $1,900,000,000. Since 1925 a number of pipe lines from 100 to over 400 miles in length and three to twenty-two inches in diameter have been constructed to carry natural gas by billions of cubic feet per year. In 1930, for increased distribution facilities for natural gas, an expenditure of $250,000,000 is expected.

"One of the greatest of these pipeline projects is the twenty-two inch line completed in 1928 from Amarillo, Texas, to Denver and Pueblo, Colorado, a distance of 340 miles. The line required eight months to construct and, with the gas lands secured to assure a lasting gas supply, cost—$25,000,000.

"The line rises from 3,800 ft.

above sea level at Amarillo to 7,000 ft. at Denver. It has a capacity of 100 million cu.ft. of gas per day, and needed 81,000 tons of pipe for its building. To supply these Colorado cities, 350,000 acres of gas lands were secured, on which are twenty-eight wells at present producing, with an open flow capacity of 625 million cu.ft. per day.

"Birmingham, Alabama, and Atlanta, Georgia, are now reached by a 450-mile gas line from Louisiana. A line nearly 400 miles in length, able to handle a peakload of 250,000,000 cu.ft. per day, serves Kansas City. St. Louis, Salt Lake City, Cincinnati, Cleveland, Buffalo, Louisville, New Orleans, Los Angeles, San Francisco and Pittsburgh are other larger cities served by natural gas.

"In California, natural gas is rapidly eliminating manufactured gas. More than 5,000 miles of natural gas pipe line have been laid in that state alone in the last ten years, and at present a single company has 700 miles of such lines planned and under construction. When these are completed, ninety-eight per cent of the gas consumption in California will be natural gas.

"Over 1,600 miles of gas pipe line radiate from the gas fields of the Texas Panhandle, and plans are now under consideration for a gas line from that region to Chicago, a distance of 1,000 miles.

"No definite figures on the potential volume of natural gas in the United States are available. But the building of great gas-distributing systems at a cost of hundreds of millions of dollars clearly indicates that the industry is confident that natural gas is available in staggering quantities and will be a source of power for many years. It is estimated that the two gas fields which now supply San Francisco are capable of producing 4,000,000 cu.ft. of gas daily for seventy-five years.

"Approximately eighty per cent of the natural gas produced in the United States is put to industrial use. The largest consumers are the producers of oil, who use gas engines for drilling, pumping, and compressing natural gas in gasoline plants. Petroleum refining, generation of electricity, and carbon black manufacture also account for large amounts of gas. The use of natural gas for industrial purposes was nine per cent greater in 1928 than in 1927.

"The superiority of natural gas and also of gas from the cracking process and from crude-oil distillation over other commercial gases for heating purposes is evident from the consideration of the calorific values of the common fuel gases. Natural gas will average approximately 1,000 B.t.u. per cu.ft., and crude-oil distillation gas about the same figure, while cracking still gas averages 1,250 B.t.u. By comparison, carburetted water gas has about 500 B.t.u. per cu.ft., coke oven gas is slightly lower, and blue water gas about 300 B.t.u.

"In 1928 a total of 320,877,000,000 cu.ft. of natural gas was supplied to 4,336,000 domestic consumers in over 2,000 communities in the United States. This was an increase over 1927 of 10 per cent in the number of consumers and eight per cent in the amount of gas used. The value of this gas at points of consumption was $225,000,000.

"From an insignificant volume fifteen years ago, the production of cracked gas had risen rapidly, with the development of the cracking process, to an estimated volume of 275,000,000,000 ft. for the year 1930.

"The modern cracking process has been tried out with success on high- and low-temperature coal tar, creosote oil, cannel-coal tar, water-gas tar and high-boiling tar acids. Gas yields varied from 450 to 700 cu.ft. per barrel of charging stock except when cracking tar acids, which gave approximately 1,000 cu.ft. of gas per barrel in ordinary operation and 1,900 cu.ft. when steam was used.

"Another product whose value is not yet fully realized is gas from stills used for the distillation of petroleum at atmospheric pressure. The production in 1929 was approximately 270,000,000,000 cu.ft. from nearly a billion barrels of crude oil run to stills. This is an increase of 200 per cent in ten years.

"Extension of the use of natural and petroleum gases will partially solve the fuel problem, but the full solution requires the cooperation of the coal industry. The coal resources of the United States can furnish an almost incalculable amount of gas. By carbonization processes, coal can be converted into gas, coke and tar. The tar can be converted by the cracking process into gas, gasoline and coke. The coke from both carbonization and cracking can itself be converted into water gas or producer gas.

"The erection and operation of gas and cracking plants at coal mines would be a tremendous step forward in true conservation. There would be but two products to ship from these plants: gas and gasoline. The gas would be piped to points of utilization instead of shipping coal. The motor fuel produced at the mine by the cracking process could also be pipe-lined to consuming centers.

"The adoption of this plan would be sound fuel progress and a great boon to the nation."

New York Grants Re-Hearing in Rate Case

UPON application of the City of Buffalo, the New York Public Service Commission has granted a re-hearing of its decision in the gas rate case which was published in the American Gas Association Information Service No. 91, June 9, 1930, and the operation of the Commission's order of May 7, 1930, has been stayed pending determination of the commission on the re-hearing.

Thomas R. Boyes Passes Away at Home

ANNOUNCEMENT of the death of Thomas R. Boyes, father of Kurwin R. Boyes, secretary of the American Gas Association, was made as this issue of the A. G. A. MONTHLY went to press. Mr. Boyes died at the family home, in Providence, R. I., on July 12.

Harry P. Dains Dies After Accident

HARRY P. DAINS, for many years connected with the Roberts & Mander Stove Company, Philadelphia, Pa., as director and New York representative, died suddenly June 30 following an accident which occurred a week previous at his summer home at Medford Lakes, N. J. Mr. Dains, who was in his fiftieth year, is survived by his widow and three daughters.

Mr. Dains had been active in the gas industry for many years, having been employed by the Welsbach Company, Humphrey Water Heater Company and Roberts & Mander.

Columbia Offers Graduate Courses in Fuel Technology

Professor J. J. Morgan, Chemical Engineering Department, Columbia University.

By PROFESSOR JEROME J. MORGAN

STATISTICS show that the combined production of bituminous and anthracite coals in the United States is about 600 million tons per year. In addition, there is produced each year petroleum equivalent in heating value to 250 million tons of coal and natural gas equivalent to about 50 million tons.

Added together these give a total for the fuel industry of the equivalent of over 900 million tons and make this industry in point of mere weight of material by far our premier industry. If we consider the dependence of other industries upon fuels and the part which the energy developed from fuels plays in our modern civilization, there can be no doubt that the fuel industry is our most important industry.

Nevertheless, big as it is, and essential as are its products to our industrial development, there are many signs that all is not well in the fuel industry. Both the hard and soft coal branches of the industry are experiencing depressions and in each there are many problems of production, distribution, and utilization to be solved.

The petroleum branch of the industry is having much trouble with the problem of stabilization of production, and in the refining of petroleum, practice is changing so rapidly that the methods of one year may be almost obsolete before the end of the next. A large distributor of solid fuels recently expressed the opinion that the fuel industry is upon the brink of great changes, and that the next five or ten years would see almost a complete revolution in the methods of utilization of solid fuels, particularly in regard to methods of domestic heating.

Even in the gas industry and in the electric power industry there are many unsolved problems, and both industries are eagerly searching after further economies in use of fuels and in the development of heat and power therefrom.

It is with these needs of the industry in mind, and the realization of the part which must be played by engineers who are especially trained in fuel technology that Columbia University, New York, N. Y., through University Extension, offers two new graduate courses in fuel technology.

These courses aim to treat, from the chemical engineering standpoint, and in a post-graduate manner, the applications of scientific principles in the production, distribution, and utilization of solid, liquid, and gaseous fuels. The subject matter is introduced mainly by assigned reading in textbooks and in technical periodicals.

The classroom periods are used for lecture and class discussions of the material in the assigned readings and of problems involving calculation and design. Both courses are open to qualified students on the approval of the instructor. While it is advised that they be taken in the sequence given, either course may be taken alone.

The first course, Fuel Technology I, deals with solid and gaseous fuels, and is given on Friday afternoons from 4:10 to 6:00 during the winter session, beginning September 26, 1930. Topics treated in the course include: Theory of combustion with special reference to solid and gaseous fuels; carbonization of coal at low- and high-temperatures; production and purification of gaseous fuels; storage and distribution of city gas; utilization of fuels including temperature measurement, furnaces and fuel appliances, heat balances, and fuel efficiencies; public utilities and their relation to the fuel questions.

The second course, Fuel Technology II, deals mainly with petroleum, and is given Friday afternoons from 4:10 to 6:00 during the spring session, beginning February 6, 1931. It treats in general of the importance, origin, and occurrence of fuels, and in particular of the winning, refining, and marketing of petroleum and its products. It includes discussions of the theories of heat transfer, of condensation, and of cracking of hydrocarbons in their applications to refinery practice; petroleum and natural gas as chemical raw materials; oil shales and other sources of liquid fuels; and the utilization of liquid fuels.

Death of Mr. Ryerson

WILLIAM NEWTON RYERSON, president of the Trojan Engineering Corporation, director of the Peoples Light and Power Corporation, and a member of the American Gas Association, died at his residence in the Hotel Shelton, New York, on July 7, after a lingering illness of several months.

Modern Weathermaking

The Application of Air Conditioning to the Home with Gas as Fuel

By Margaret Ingels

Carrier-Lyle Corporation, Newark, N. J.

WEATHER is a highly important thing in our lives, and has been of interest to us through all the ages. Eight thousand years ago when the early civilizations learned the rudiments of agriculture, the importance of weather was first realized. The Government knows the importance of weather and spends thousands of dollars a year so that each of us will know what the next twenty-four hours are going to bring. Newspapers appreciate the interest of the public in the weather so that the report is always front-page news.

The weather affects each of us in our everyday habits and actions. Our recreations depend almost entirely on the weather.

With the change of seasons, women folks feel the longing for new clothes.

Menus are planned according to the weather, featuring hot soups for the winter and cool salads for summer.

Because the weather is so important in our lives, it has naturally become a topic of universal conversation. We talk about the weather on all occasions, but to say as Mark Twain once did that, "No one is doing anything about it" is as much of an exaggeration as was the premature report of that great writer's death.

It is gratifying to us who are connected both directly and indirectly with the gas industry to know that gas fuel is playing an important part in the development of weather in the home. This subject will be dealt with at more length after we understand something of the principles of air conditioning.

Of course, it is not practical to try to control the elements of nature and make weather out of doors; but few of us are out doors much of the time. In fact the average person is only out doors ten or fifteen per cent of the twenty-four hours. We spend our lives indoors and it is weather for indoors that lends itself to scientific control.

Doing something about indoor weather began in the laboratory. Investigations were first conducted to determine the importance of chemical properties of air. The chemical properties of air are—oxygen, carbon dioxide, nitrogen, argon, helium, neon and traces of other elements, but the two which are important to us are oxygen and carbon dioxide. Most of us remember being taught in grammar school days that we breathe in oxygen and exhale carbon dioxide. It is a popular idea that when we have remained in a room for a long time, we have used up all the oxygen and fill the air with carbon dioxide.

Many tests have been made to find out what really does happen when the air is rebreathed. One of the most spectacular was that by the late Harry Houdini. He allowed himself to be sealed in an airtight box. This box was lowered to the bottom of a swimming pool. He remained in the box one hour and thirty-one minutes. In that time he breathed all the air in the box four times. The oxygen was reduced by five per cent and the carbon dioxide was increased to 110 times that of normal air. Yet Houdini is quoted as saying after such tests, that he felt no bad effects from the extreme chemical changes in the air he breathed.

Such changes can only be obtained under test conditions in airtight compartments. They never occur in rooms which we occupy. Even the air in the pit of a London theatre after a crowded performance contained but a fraction of a per cent less oxygen than that of normal air.

Now in our homes, the air inside is about exactly the same, chemically, as that out of doors. There is always so much air leaking into even a well-constructed house that there is approximately a new supply of air every hour. The air leaks in around windows, under doors, and even through the walls.

When in an enclosed room, we do not use up the oxygen in the air, nor do we fill the room with carbon dioxide, but we do something else to the air, and it is this something else which is of utmost importance.

Each of us may be likened to a tea kettle because we are giving off heat and moisture. In fact, each one of us is giving off so much heat all the time that if it were concentrated it would be sufficient to boil and completely evaporate one-third of a pint of water an hour. Were it possible to change this heat to energy, it would be sufficient to lift us from 2,000 to 2,400 feet into the air. The air surrounding us must be able to carry off this heat and moisture. It is important to carry it off at the rate it is generated. If the air is too cool and too dry, we lose heat and moisture too fast for comfort. This is what we must prevent during the cold, winter months. If the air is too warm and too moist, we lose heat and moisture too slowly for comfort. A hot, summer day is much warmer when the humidity is high, and a cold, winter day is much more severe when there is a strong wind. To fully understand the effect of each of these factors, we should define them.

Temperature is a factor with which we are all familiar—32° we know means ice, and 212° means boiling water.

Relative humidity, however, is an expression rather vague to most of us. It is important because it influences the effect of the other two factors on our sense of comfort. It is the amount of moisture contained in the air at a given temperature compared to the amount the air would contain were it full or saturated with moisture at that temperature. The amount of moisture that air is capable of holding depends on the temperature of the air. It has been found that the warmer the air gets, the more moisture it is capable of holding. That is, the air is expanded by heat and its capacity for holding moisture is increased.

The explanation of relative humidity may be made more simple by considering a given quantity of air at 31° temperature and 70 per cent relative humidity. If this air is heated to 50° and no moisture is added, the relative humidity is reduced to 35 per cent.

If the air is heated still further to 70°, and the moisture content kept the same, the relative humidity will be only 17½ per cent because the air's capacity for holding moisture has been greatly increased by heating it to 70°. Heating air without adding moisture makes it relatively drier, or in other words, lowers the relative humidity.

This condition of 31° and 70 per cent relative humidity is the average outdoor condition for New York City for February and is approximately the average for the cold months, December, January and February. When this air comes indoors, which it does even with all windows and doors closed, as has been explained, and is heated to 70° with no moisture added, it has a relative humidity of 17½ per cent. This is the kind of air in which we live during the winter. It is the weather of the Sahara Desert. What effects are attributed to our living in this warm dry air?

In the winter is when we are bothered most with colds. If we are true to the average person in the United States, we will have at least two good hard colds a year. The common cold causes most of our sicknesses, and because they are so prevalent, Johns Hopkins University is making a five-year investigation to learn the cause and cure of the common cold. Most of us think we know what gives us a cold. We think it is wet clothing or shoes, exposures or drafts, but the Eskimo has all of these and still he is practically free from colds. He does not live in warm, dry air indoors. The walls of his igloo being made of ice and snow provide the moisture to humidify the air indoors as it is heated.

Studies made by the United States Public Health Service indicate the prevalence of various respiratory illness during the winter months, a time when the air in our homes is almost sure to be too dry and over-heated.

When we go out of doors on cold, winter days, our noses run. This is a nuisance, but it is an interesting fact that the nose is supplying the moisture to humidify the air before it gets to the lungs. When outdoors, the mucous membrane is very moist. When we come indoors, the warm, dry air quickly drys the mucous membrane causing it to become irritated, and, it is believed, a more active field for bacteria. Dry air means dustier air which is germ-laden, so that more germs reach this active field for infections.

Dry air affects our looks too. English women and Irish women are fortunate to live in moist climates. They do not keep their homes as warm as we do, so that their indoor air is quite moist. Their complexions are much more beautiful than those of the American woman, and one medical authority attributes this to the moist climates which they have indoors and out.

Dry air indoors also has a decided deteriorating effect on interior furnishings. It causes glues to dry out, and woods to warp. The thread in fabrics dry out so that rugs, upholstering and draperies show wear very quickly. As stated, dry air means dustier air so that the problem of keeping things clean is made more difficult.

The A. S. H. V. E., the United States Bureau of Mines, the United States Public Health Service carried on a series of comprehensive tests to find out just what the temperature, relative humidity and motion of air should be for comfort and health. These investigations were made in rooms where each one of the variables could be changed and hundreds of tests were made. People of all ages and all professions voted on the most comfortable condition, and doctors made tests to find out the reaction within the body. A condition found desirable by the majority of the subjects was 70° and from 35 per cent to 40 per cent relative humidity. To increase the relative humidity of indoor air in winter from 17½ per cent to 70° to 35 per cent to 40 per cent at 70°, means adding large amounts of moisture to the air. It takes many gallons a day. The six-room house, used in previous examples, would require an addition of two quarts of water every hour during the winter. This amount of water must be added each hour to properly humidify the air which is leaking in.

Air should also be in motion or we would become encased in a layer of warm, humid air, which approaches body temperature and loses its capacity to absorb heat. Moving air means a continual supply of new air being brought to us. It also means uniform conditions due to the stirring effect.

Controlling the temperature, relative humidity and motion and providing clean air is known as air conditioning. Like all sciences, it is based on fundamental laws. The engineer chiefly responsible for the discovery and application of these laws was Willis H. Carrier, vice-president of the American Society of Heating and Ventilating Engineers. Although the science is rather new, being only about 25 years old, it has long since passed the experimental stages. Many types of buildings now condition their air so that they are truly making their own weather.

Department stores are air conditioned so that summer and winter shopping in them is a pleasure. Moving picture theatres are vastly increasing their patronage by providing conditioned air or manufactured weather. The United States Government appreciates the value of having cleaned air at just the right temperature, humidity and motion, and provides it in the House of Representatives and Senate Chamber. The President's executive offices have been similarly equipped. One air-conditioned office building in Texas served as a home for a hay fever sufferer who moved into the building and stayed there throughout the season. He felt completely relieved when living in this kind of air.

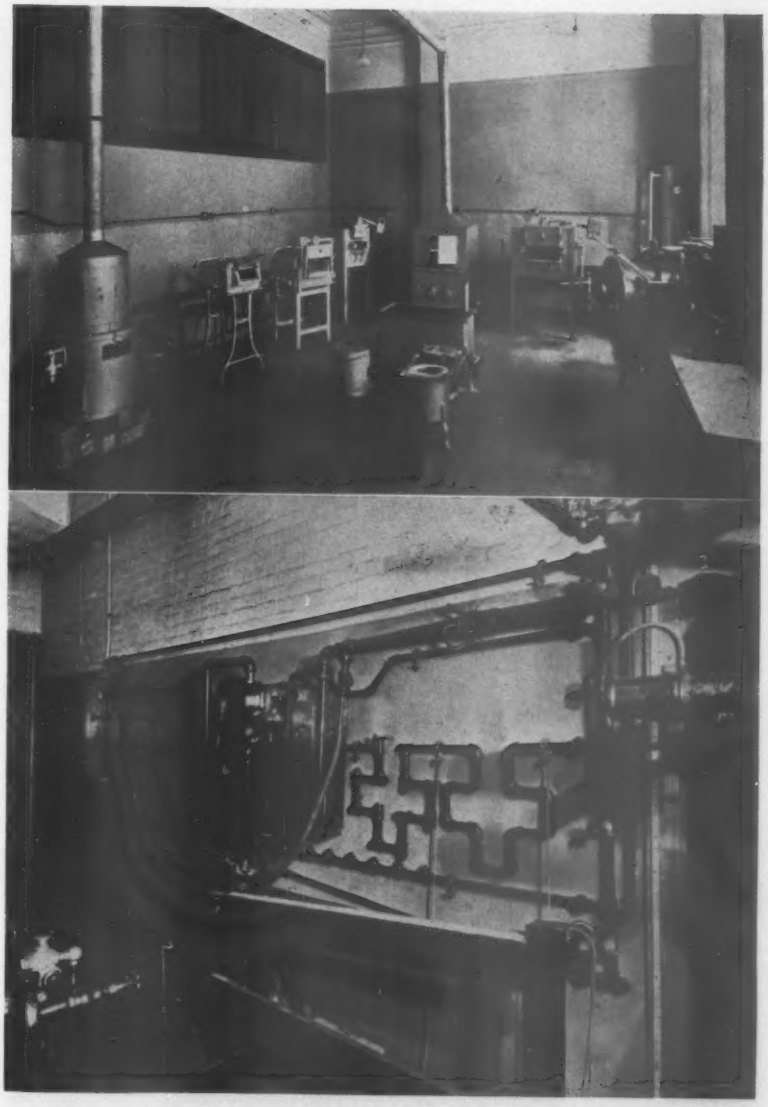
In the industries there are more than 200 different kinds of products made in factories who manufacture their weather. Candy, tobacco, foods, drugs, textiles.

This new science of air conditioning is now being applied to improve the air in the home. The importance of making the weather in which we live is slowly being realized. Controlling not only the temperature, but the humidity, motion and cleanliness of the air is a health measure.

Making weather in the home has resulted in a new application of gas; for domestic air conditioning depends on gas fuel to supply heat to the air. It is fitting and logical that this should be so. Gas offers the ideal fuel for house heating and air conditioning of this kind for it is synonymous with cleanliness, is highly efficient, easily and safely controlled and flexible.

(Continued on page 376)

Brooklyn Gas Engineering Course Enters Fourth Year



Above—Heat Treating Laboratory at the Polytechnic Institute of Brooklyn. Students in Gas Engineering spend five sessions in this laboratory studying furnace performance and operation.

Below—An experiment in the Mechanical Laboratory. The purpose of this experiment is to show the pressure loss in pipe lines due to the various fittings.

THE completion of the Gas Engineering Course at the Polytechnic Institute of Brooklyn, by the third class in May of this year brings the total number of gas company employees to successfully pass the requirements to 130. These men are now equipped with a better understanding of the gas business in all its branches and a clearer understanding of their own job and its relation to that of their fellow workers with the consequent broader and more comprehensive outlook which is of prime importance for satisfaction and advancement in one's chosen field.

The fourth year of the course will start October 2 with the same general purpose which the past has proven to be sound.

The material of the course is arranged and scheduled primarily to lay before the student, in logical sequence, the general principles involved in the manufacture, distribution and utilization of gas. The subject matter of the course is presented in a series of twenty-six lectures delivered by men of long experience in their respective fields.

Lectures are given in the physical and chemical properties of gases; the manufacture and purification of coal and water gas and a study of the equipment involved; distribution system, design, operation and maintenance; gas measurement; the chemistry of combustion; industrial furnace types and control of combustion; domestic appliances and gas company organization and public relations. These lectures are supplemented by timely inspection trips to gas plants and manufacturing plants using gas in production work.

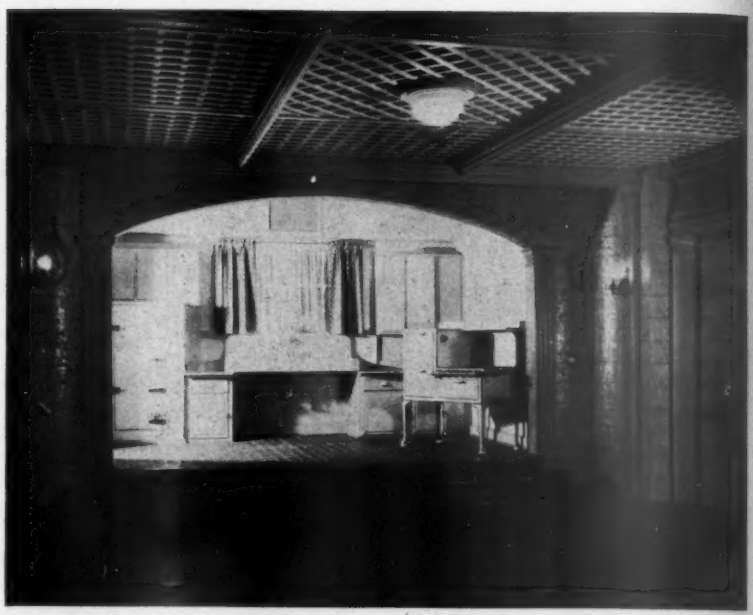
This course is given during the evening and is open to employees of gas companies and related industries who have had the equivalent of high school training in chemistry, physics and algebra.

Application forms and any information regarding the course may be obtained from Professor E. F. Church, Jr., Department of Mechanical Engineering, Polytechnic Institute of Brooklyn, 99 Livingston Street, Brooklyn, N. Y.

Winning Mrs. Consumer with Demonstration Teas

By MABEL CLAIRE ATWOOD

Director, Home Service Department, Grand Rapids Gas Light Company



View of Home Demonstration Department of the Grand Rapids Gas Light Company

OUR Home Service Department was opened in May, 1928, and one of the first problems, of course, was to get the proper kind of publicity regarding its activities and its attractions to the women of the community and particularly to obtain promising material for future classes.

It was during these early days that a request was made to us which resulted in one form of activity of our Home Service Department which we feel has been perhaps the greatest single factor in bringing its functions effectively before literally thousands of local women. It is outlined in detail here because it may possibly suggest an idea to other home service directors, although the idea itself is not at all a new one.

There has been locally, for several years, a custom among various industrial concerns, such as laundries, commercial bakeries, and others, of offering a prize or bonus to organized groups of women who would come in a body to that particular industry and be shown through the plant in order to be made acquainted with its products.

A woman representing one of the organized church groups visited our Home Service Department shortly after it was opened, and desired to know whether we had any plans for such groups to visit our department and whether they would be paid anything for doing so. She cited what other firms had been doing, some actually paying as high as $50 to the chairman of the group's treasury, in case a group numbering at least fifty was taken through their place of business. She felt confident that a Home Economics Department would make a much stronger appeal to women and that she would be able easily to bring a number if we would plan an afternoon for them.

We realized at once that it would not do at all to offer any cash contribution, but that we had sufficient attractions in our new department to well repay the women for their visit, but we also realize that some special incentitive would probably be needed. We knew that some home service departments had carried on similar activities in the way of giving a lecture demonstration and so we evolved a plan which we thought would appeal.

We figured that we could serve them an afternoon tea, which would probably not cost us more than 15 or 20 cents per person served. We suggested that this would be served entirely at our expense and that the group was at liberty to make such charge to its members as it might wish, for the afternoon. The collection of such money, however, to be entirely in their own hands and all of it to go into their own treasury. Our only proviso was that there would have to be a minimum of forty women who would visit the department on the specified afternoon, see the display rooms and have explained to them the services which the department could render to the homemaker.

A lecture-demonstration, which would give us the opportunity to show the various gas appliances and the effectiveness, cleanliness and convenience of gas as a fuel, was to be included. Following the demonstration, the tea would be served to the group.

When the plan was outlined to the woman who had made the inquiry, she was very much taken with the idea and a short time later was given the opening date for this special activity.

This single lesson lecture-demonstration so planned has proved to be very popular and has exceeded even our highest expectations. As a means of spreading the news concerning our Home Service Department, this method

Another Corner of the Home Demonstration Department of the Grand Rapids Gas Light Company

of having one woman tell another has been in this experience of ours, a most effective one. No other publicity was given to this activity, except as the members of one group passed the word along to those of another.

Our opening date was in September, 1928, and before January, 1929, the entire season was booked, one day of each week being reserved for this work. After the regular cooking classes closed in April, 1929, three days of each of the succeeding weeks until the summer recess were required to accommodate those desiring appointments for the single lecture-demonstration and from that time on we have been reserving dates for more than a year in advance. At the present time a sufficient number of requests are now in our files to carry us until May, 1931. Up to the present time we have had 3,547 women in attendance. It should be added that only those women who have not already been in attendance at one of these demonstrations, are eligible.

The women who attend these group meetings learn of our other activities—the following up of the installations of gas appliances, our regular courses of instructions and special courses, as well as our office consultation work. We secure the names of all of the women attending for our mailing list and frequently we find sales prospects among the members of these groups, and these women largely have been the ones who later on have enrolled in our classes.

A. G. A. Renews Scholarships

PURDUE UNIVERSITY and the Johns Hopkins University have accepted the renewal for the 1930-31 school year of the American Gas Association Scholarships in Gas Engineering. These scholarships were offered for the first time last fall upon recommendation of the Committee on Education of Gas Company Employees and were held by Herman E. Ellerbrock, Jr., at the Johns Hopkins University and by Julius Evard at Purdue University. The showing made by both students was such that the committee voted to renew the offer to these two institutions.

These scholarships are made possible by the Trustees Gas Educational Fund which was turned over to the American Gas Association a few years ago. It is the income from this fund that is now being used for the scholarships.

The selection of the beneficiaries of these scholarships will be made in each case by the dean and the professor in charge of the gas engineering department. They will be made to either a worthy engineering undergraduate who, without this financial assistance, might find it impossible to continue his studies, or to a student doing graduate work under the supervision of the department of gas engineering.

Thirty-Six Take Household Engineering Course

THROUGH the cooperation of the American Gas Association and The Consolidated Gas Company of New York, thirty-six students are enrolled in the Household Engineering Course being given this summer at Columbia University.

T. H. Schluening, engineer of the Consolidated Gas Company, is responsible for the equipment of the laboratory, much of this equipment being loaned by various manufacturer members of the A.G.A.

Eighteen of this enrollment are home service workers of utility companies.

Smoke Rains Poison on People

SULPHURIC ACID, falling like rain, precipitates from unabated smoke to the extent of from eleven tons to 190 tons per sq.mi. annually on modern cities, announces the United States Bureau of Standards.

This startling fact is the result of a world-wide survey of the dangers of industrial and domestic smoke. It lends greater weight for waging war against smoke in order to preserve human health and life.

Faulty combustion of raw fuels creates sulphur dioxide in the atmosphere which combines with the natural moisture to precipitate sulphuric acid, the report shows. Sulphuric acid has a deteriorating effect on building stone, metals, and vegetation, not to mention the havoc it plays with sensitive membranes of the human body, such as the nose, throat and lungs.

Anti-Smoke Work

HUDSON COUNTY in New Jersey is organizing a bureau of smoke elimination with a view to ridding Jersey City and its environs of the pall of black smoke that defaces them much of the time at present. Laboratory experiments and research work will be carried on at Stevens Institute, and in addition, a campaign of education will be conducted in the smaller communities of the county among railroads, manufacturers and others that have been offenders in the matter of smoke.

This sort of action is spreading in American cities troubled with smoke. Communities are learning that it isn't necessary to stand for the nuisance. Research has discovered the best types of fuel and the right methods of burning them. As fuel-burning concerns learn that smoke is wasteful as well as disagreeable and unwholesome, they are usually glad to cooperate by installing the mechanical equipment necessary for smoke elimination.

Hopkins Offers Innovations in Gas Engineering Course

DURING the year 1929-30 the work of the Department of Gas Engineering, Johns Hopkins University, Baltimore, Md., was enhanced by the appointment of Dr. Lloyd Logan to the staff with the rank of associate professor. Dr. Logan had previously held the post of research associate in gas engineering.

Dr. Logan has a long record of engineering and research experience—about twenty-three years—with organizations and institutions, such as the Koppers Company Laboratories, the Mellon Institute, Stone and Webster, the Semet-Solvay Company, the General Electric Company, the Lake Torpedo Boat Company, and others. He has pursued special courses at a number of educational institutions, including the Royal Technical College, Glasgow, Scotland, the Massachusetts Institute of Technology and the University of Pittsburgh. His graduate work was done at The Johns Hopkins University and he was the first candidate to receive the Doctor of Engineering in Gas Engineering, his dissertation being entitled "An Investigation of the Manufacture of Water Gas with Especial Reference to the Decomposition of Steam," a problem suggested by Professor W. J. Huff, under whose general direction the research was prosecuted.

Prior to coming to The Johns Hopkins University in 1926, Dr. Logan had been actively in charge of engineering and research projects for the Koppers Company, builders of by-product coke and gas plants. Dr. Logan was in charge of the field experimental division of the laboratories for a time before coming to Johns Hopkins.

With Dr. Logan's experience and aid it was possible to introduce some important innovations in the instruction in gas engineering which have greatly aided the presentation of laboratory work. A truck equipped with sufficient seats to care for the entire senior class was purchased and arrangements were made with certain industrial concerns in the vicinity of Baltimore to permit the students to use the plant facilities for instruction. A laboratory group could thus be assembled at the University with such analytical apparatus as may be required and transported in a few minutes to large operating plants for the examination of interesting unit processes. Much of this work was done in active cooperation with the Consolidated Gas Electric Light and Power Company in the Spring Gardens Water Gas Manufacturing Plant, at the Riverside Purification Station, and the Front Street Appliance Testing and Distribution Laboratories; but work was also carried on actively with other organizations, notably with the by-product coke plant of the Bethlehem Steel Corporation. Other organizations which cooperated were the Maryland Meter Works, the Bartlett-Hayward Company, and the Philfuels Company at Reisterstown, and the truck made it possible for the class to visit conveniently and examine a number of other operations, such as those of the Eastern Rolling Mills, the Porcelain Enamel and Manufacturing Company, the Crown, Cork and Seal Company, the E. H. Koester Bakery and the Glidden Company, all in Baltimore or vicinity.

The truck transportation also made it possible for the class to visit the Fixed Nitrogen Research Laboratory in Washington, D. C., and in Easter vacation an extended trip was made to New York City and vicinity. During this trip the graduating class visited the Seaboard By-Product Coke Plant, near Newark, New Jersey, and the Astoria and Hunt's Point plants of The Consolidated Gas Company of New York.

One feature of the fourth-year work in Gas Engineering has always been the design and layout of a gas plant and distribution system for a small community, such as Annapolis. The work is greatly facilitated and rendered more interesting and valuable with the convenient transportation now available.

Summary On Gas Engineering Course

Following is a summary of the report of the Department of Gas Engineering of the Johns Hopkins University for the year 1929-30:

Increase of Staff: Dr. Lloyd Logan added to staff as Associate Professor, Mr. Elliott, a graduate student, and Mr. Bittinger, an advanced student, engaged to assist in research work during the summer.

Enrollment: The enrollment was made up of thirty undergraduate and three graduate students, a total of thirty-three.

Scholarships: Two new scholarships were established during the year, making a total of nineteen. New students urgently needed to replace graduates.

Graduates: Three Doctors' and seven Bachelors' degrees were awarded during the year.

Research: The research work of the Gas Engineering Department developed into plant operations during the year. New research projects are now under way. The American Gas Association is cooperating. Much material published is now available to the gas industry.

Consultation Service: Frequent consultation service was rendered during the year. This service, a valuable feature of The Hopkins Gas Engineering Course, is now available to the gas industry.

Transportation for Field Work: Purchase of truck facilitated the field work and made it more interesting and valuable.

Support of Gas Engineering Department: The Advisory Committee secured pledges amounting to approximately $78,000 for the five-year period, 1929-1934.

The purchase of this truck was made possible by subscriptions to the work in Gas Engineering. The funds were given in response to an appeal by the Advisory Committee on the Department of Gas Engineering of which W. R. Addicks, senior vice-president of The Consolidated Gas Company of New York, is chairman, and Charles M. Cohn, vice-president of the Consolidated Gas Electric Light and Power Company of Baltimore, is secretary. Other members of the Advisory Committee are Howard Bruce, chairman of the board, the Bartlett-Hayward Company; H. B. Rust, president of the Koppers Company; H. S. Schutt, vice-president of the C. H. Geist Company; Philip H. Gadsden, vice-president, the United Gas Improvement Company; and L. I. Pollitt, president of the Southern Gas and Electric Corporation. Mr. Pollitt was active in launching the university work in Gas Engineering and has always been a member of the Committee of the Southern Gas Association handling the cooperative relations between the association and the university. This Advisory Committee lost by death Robert M. Searle during the past year.

The Advisory Committee abovenamed has secured pledges amounting to about $78,000 for the continued support of the work in gas engineering.

The research work carried on by the Department of Gas Engineering with the support of four prominent gas companies operating in the cities of Baltimore, Buffalo, New York and Rochester is being continued. The experimental program has developed into plant operations and much of the work is being done at the plants in Baltimore and New York. This work is under the direction of Professor Huff, with Dr. O. W. Lusby, research associate in gas engineering as senior aide. D. T. Bonney, research assistant in gas engineering, and several assistants are employed in the experimental program. Dr. Logan has given this work some time during the past year, chiefly in connection with patent applications, of which a number have been filed covering new features. These applications have usually been joint applications of Drs. Huff, Logan and Lusby.

A new research project has been brought to the Department of Gas Engineering by a committee of the American Gas Association, which is in the hands of Professors Huff and Logan. The problems relate in part to synthetic changes in manufactured gas and are engaging the full time services of Professor Logan this summer. He is being assisted by M. A. Elliott, a recent graduate of the department, and by D. S. Bittinger, who will have a fourth-year standing next term. The services of a secretary are also provided. If the preliminary study thus made possible opens up questions which are deemed important enough to warrant the continuance, additional funds will no doubt be found. The American Gas Association Laboratory, at Cleveland, Ohio, is cooperating in some phases of this study. The Association committee is functioning under the chairmanship of J. A. Perry. Professor Huff is a member of the committee and has been made responsible for the disbursements at Johns Hopkins University.

Professor Logan completed one portion of his study upon steam decomposition in the water gas machine and took up another phase during the past year. He was assisted by members of the graduating class and was able to establish some interesting correlations.

The past year was notable in the history of the graduate work done by the department as it marked the completion of the requirements for the doctor's degree by three candidates. Dr. Logan, as already noted, received the degree of doctor of engineering. John C. Holtz, working under the direction of Professor Huff, completed his researches on organic sulphur compounds in gas making and submitted to the Board of University Studies a dissertation entitled "The Origin and Decomposition of Organic Sulphur Compounds under Gas Making Conditions with Particular Reference to the Role of the Carbon-Sulphur Complex."

Charles Gordon Milbourne, who likewise worked under the direction of Professor Huff, completed his studies on the purification of gas and submitted to the same Board a dissertation entitled "The Removal of Hydrogen Sulphide from Gas by Means of Iron Oxide with Special Reference to Humidity Conditions."

Upon examination, the Board found that both candidates had met the prescribed requirements and recommended them to the trustees as candidates for the degree of doctor of philosophy.

The following graduate course was given: Seminary and Journal Meeting, two hours weekly, through the year. Professor Huff.

The graduate research topics have been indicated in the preceding discussion.

The Department of Gas Engineering received two new scholarships during the past year, one for $350 from the American Gas Association, which was bestowed on Herman H. Ellerbrock, to assist him in graduate work in Gas Engineering, and one from the Columbia Gas and Electric Corporation, which was given to Albert Pfetzing, a first year student from Cincinnati.

Scholarships given in the past have in general been renewed as follows:

Consolidated Gas Electric Light and Power Company of Baltimore, 2.

Washington Gas Light Company, Washington, D. C., 3.

Central Public Service Corporation, 5.

The Consolidated Gas Company of New York, 2.

C. H. Geist Co., Philadelphia, Pa., 1.

Mobile Gas Company, Mobile, Ala., 1.

Philadelphia Suburban Gas & Electric Light Company, Philadelphia, Pa. 1.

Tampa Gas Company, Tampa, Florida, 1.

The Koppers Company, Pittsburgh, Pa., 1.

The usual undergraduate instruction with certain developments, some of which were noted above, was given.

The total enrollment was thirty-three, of which three were graduate students.

In addition to the three candidates for the doctor's degree, seven candidates were recommended for the bachelor's degree. The following were recommended for honorable mention: John William Carroll and Martin Anderson Elliott.

At the invitation of the department, Thomas R. Weymouth, president of the Oklahoma Natural Gas Corporation, and one of the leading gas en-

(Continued on page 375)

*A Prize-Winning Paper—

"My Company's Contribution Toward Improvement of Home Life"

MY company's contribution toward improvement of home life, embraces a multitude of services. We have not the time to detail the promotion of good will among consumers through courteous and intelligent service, at one of the lowest rates in the country, or the establishment of friendly relations through home service inspections, tests and demonstrations. Nor can we go into employee education, or first-aid training, and their valuable application in the home. However, we do wish to say a few words about the greatest contribution any utility can offer, toward improvement of home life,—the problem of making housework easier.

The introduction of gas into the home was like touching the kitchen with magic, giving the housewife a dozen maids to perform her wearisome tasks. It made a singing mistress of an overburdened slave,—that slave being the person we love most in all the world,—Mother!

Let me draw for you—two pictures.

The housewife of years gone by, cooked food for her family on a wood or coal stove, or in an open hearth,—carrying in her fuel, and building daily fires, even during the heat of the summer. She heated water by the same method, placing her kettle on the stove. No wonder that it was impossible to have an adequate supply for all purposes, and that daily bathing was unheard of.

Refrigeration,—well, there just wasn't any, except the slight relief of a somewhat cooler cellar; but food could not be properly kept in summer. Houses were heated with coal or wood stoves, requiring constant attention. Fuel had to be brought in, and ashes removed, and the house was probably cold at times, besides. Waste had to be carried out into the cold, to the garbage can, or burned in the kitchen stove, with a resultant bad odor. No little wonder that these tasks consumed ten or twelve hours each day, leaving no leisure time for education, spiritual vision, or even family or other social contact. Each evening found the same weary little mother finding her way to bed, to try to gain sufficient strength for the next day's same arduous tasks.

And then there came a fairy-godmother, to rescue her Cinderella,—and her magic wand was—"Gas"!

The housewife today prepares her meals with the aid of a beautifully enameled gas range, with a perfectly regulated oven, which insures results. No fuel to carry, no ashes to remove, just a simple, practical, inexpensive gas flame. Imagine the time-saving!

An even greater blessing came with the advent of the gas water heater. The circulating tank heater was a long step forward, but now even the modest workman's cottage can be equipped with an automatic storage water heater, for constant, hot water service, without any attention being required. I wonder if we really appreciate this great advantage!

How impossible it would be, after a hot, sticky day at the office or shop, during July or August, to enjoy a delicious meal, or a beautiful bit of music, or even the refreshing, cool, evening breeze,—without the comfort of the daily bath, and clean linens. We are now so accustomed to the privilege of our convenient means of cleanliness, that we are apt to take it for granted. But we should remember that there was a time when folks could take but one bath a week, or less, because of the difficulty of providing hot water. And think of the convenience of constant hot water in the kitchen, and in the laundry. There are hundreds of daily tasks that utilize hot water, and now even the modern farm home with its running water can have it constantly hot and ready to use.

And refrigeration! What a relief and saving to the housewife to have perfectly preserved food, without attention to ice-cards, or the necessity of running cellar stairs, both of which were but makeshifts; and gas refrigeration is so inexpensive, dependable, and absolutely silent. The average operating cost is but $1.50 per month, about one-third of the cost of ice; and the gas refrigerator can be installed in the kitchen, instead of the hall, thus saving many steps for the housekeeper.

As for waste disposal, there is no more perfect means than the gas incinerator. Anyone who has enjoyed this convenience realizes that there is no substitute. It saves time, is conducive toward cleaner housekeeping,

(Continued on page 374)

The Author

Mrs. Marion Croal, Milwaukee Gas Light Co.

* An essay contest was recently conducted under the auspices of the Women's Committee of the Wisconsin Utilities Association and resulted in twenty-six essays being submitted to the judges by women employees of member companies. Helen J. Welsh of the Eau Claire office of the Northern States Power Co. won the first prize, a cash award of $50., and Mrs. Marion Croal of the Milwaukee Gas Light Co. was awarded the second prize of $30. Agnes Phillipson of the Wisconsin Public Service Corp. at Oshkosh received the third prize of $20.

Natural Gas Production Economy*

By J. FRENCH ROBINSON
Geologist and Engineer, Peoples Natural Gas Company

THE natural gas business, when contrasted with some of its most active competitors in the field of fuels, namely, manufactured gas and electricity, presents some very interesting problems. In the process of manufacturing gas as well as in the generating plant of the electric business, the unit cost of producing these commodities, remains almost a constant, or in many cases, is reduced, due to improvements in manufacturing processes as well as decline in cost of raw material, such as coal and oil.

In this respect, the natural gas industry is unique and different from these other industries, due to its dependence upon a fast diminishing basic material, the supply of which is restricted to comparatively narrow limits and which can never be replaced. Therefore, the future life of the natural gas business must be prolonged by the most efficient use and economical operation of the small gas wells from which we obtain our present supply.

The steady withdrawal of gas from the older fields, causes a gradual decline in the productive capacity of existing wells and a reduction of the rock pressure in the sands. For this reason, the capacity and rock pressure of new wells are lessened and the cost to produce a thousand cubic feet of natural gas amounts higher and higher.

It is an established fact that during the life of any natural gas field, we have large and small wells. Our wells in the East are very small, as compared with a well recently completed in the Oklahoma City Oil Pool, which had a daily open flow of 250 million cu.ft. The gas from this pool is produced with the oil, separated and marketed.

If we study our individual decline curves for our producing wells, we will see that the position now occupied is well down the slope, and has taken its place along the flat part of the curve.

Production economy, theoretically, begins before production is obtained and continues long after the individual wells are abandoned. Any large producing company must hold a considerable amount of undeveloped acreage in reserve. The scientific selection of the acreage to be held is therefore quite important. A certain amount of strictly wildcat territory should be held, but if properly looked over, very little acreage need be held where there is no chance of obtaining production. There are many types of leases being made in this territory at the present time. The customary lease, however, is a flat sum per well, and usually an allowance for free gas. However, many people prefer paying a royalty rate on the pound minute basis, gauges to be taken in certain sized casing. In the first case, it is necessary to reduce the royalty rate from time to time as a well is depleted, while in the latter case this is automatically taken care of.

Systematic locating and spacing of wells plays a large part in economical production. There are three principal factors which determine the economical location of any well. First. Lease boundaries. Second. Geological conditions. Third. Topographic or surface conditions. We very seldom find an ideal location; therefore, it is necessary to study each problem individually, arriving at the best location possible. Careful thought should be given each location on a particular lease, so as to be sure that if competition arises, one will not be compelled to drill more wells on that lease than absolutely necessary.

The complete history of each individual well should be kept and studied, just as a doctor keeps a complete chart of his patients. It is very important to have a complete record of the well for study in connection with additional locations, as well as looking after and taking care of the well in future years. A permanent record of each well drilled should contain the following:

First. A record of each foot of the hole, stating whether it is coal, lime, sand, shale, etc.

Second. Steel line measurements on all coal seams, lime horizons, and the principal producing sands.

Third. The sizes and amount of the various strings of pipe in the hole.

Fourth. Depth at which the hole was reduced.

Fifth. Kind, size of packers, and depth set.

Sixth. Size and depth at which shot was placed. (If well was shot.)

Seventh. Original volume and rock pressure.

From the comparison of any individual well log with a known type section of that vicinity, wells need not be abandoned before reaching the last known producing horizon. Neither may they be drilled several hundred feet below, as has been done in many cases. Thousands of wells have been completed on which no records are available today, and this alone is costing the industry thousands of dollars. Many wells are being cleaned out and drilled deeper, on which we have absolutely no data as to where the holes were reduced, where the packers were set, and where the various strings of pipe were run. It is needless to say that this does not afford an economical condition under which to operate.

Not many years ago, the casing and tubing of gas wells was not considered important, for at that time there was sufficient pressure to clear the well of any water it might make in later years. It was customary to tube wells with small tubing, such as 2 inch. When the well reached the point where the pressure was not sufficient to clear it of water, it was abandoned. Today, conditions are much changed. Wells are being cased with larger pipe and run to a greater depth. It is quite necessary that the casing be placed below all water-bearing horizons. Some of the water is contaminated and corrodes the pipe, thereby limiting the life of the pipe. To overcome this condition, the pipe may be painted. The packers should be set as close to production as possible, but if it is necessary to place the packer well up in the hole, discs or some other protecting

*Abstract of paper presented before the Pennsylvania Natural Gas Men's Association convention at Oil City, June 26-27, 1930.

devices should be run on the pipe below the packer to catch any cavey material that might fall into the well. If necessary to tube a well, the smallest sized tubing used should be 4 inch. The well may be bailed economically through 4 inch and if larger pipe is used, the well may either be bailed or cleaned out. If it is necessary to clean out a well, which has been tubed with small tubing, the tubing must be pulled and packer fished out. On completion of the repair work, either a large string of pipe must be run in the well or it must be re-tubed and repacked. This often proves expensive. In some wells, considerable trouble has been experienced when setting an anchor packer. After a period of time, there seems to be a slight settlement of the tubing, and the packer slips. In many cases, this slipping causes the packer to let go. This has been overcome to a great extent by the following method of tubing. Before setting tubing on bottom, a measuring line is run, and if any cavings are in the hole, they are cleaned out through the tubing. After hole is thoroughly cleaned out, pipe is set on a solid bottom, which prevents future settlement. The failure of packers has been largely overcome by the use of combination wall and anchor packers, which prevents settling.

Each well should be gauged at least once a month, and usually once a week. If the well is in the line, the rise above line pressure should be taken for 1, 2, 3, 4, 5, 10 and 15 minutes. From the minute rise above line pressure and the cubical content of the well, the approximate delivery may be calculated. If the well is not in the line, the closed-in pressure should be taken. This data should be summarized monthly and compared with previous data. If any material differences are noted, the well should be given first aid, such as bailing. If it does not respond to this treatment, then it should be completely overhauled, for we feel that each well must do its best in order to meet our requirements. The Field Foremen and their crew of well trained men are constantly inspecting wells, and they know that it is their job to keep all wells producing at their best.

Wells which show a sudden decline in pressure are often found to be salted over. This condition should be treated as follows: The well should be shut in for a period of time and results observed. In some cases, moisture entering the well with the gas will dissolve the salt, while in others, it is necessary to supply fresh water to the well to dissolve the salt. If neither of these treatments prove beneficial, it will be necessary to remove the salt, either with bailer or tools.

The production from wells of small volume may, in some cases, be increased by operating the wells periodically. If used constantly, the sand may become clogged, which has a tendency to shut off the gas. By shutting the well in occasionally, the built up pressure, upon being released, tends to open up the sand.

Wells of high rock pressure and small volume sometimes freeze. Some wells have actually been abandoned due to freezing, when the operator thought the gas to be exhausted.

Usually shutting in the wells will cause them to thaw out, but in some cases it has been necessary to shoot them.

Since the re-drilling of old fields is being done at the present time, it becomes quite an economic problem to know how close to locate a well to an old abandoned one. Very few records are available, which show in detail, the method of plugging old holes. In fact, many of the wells abandoned in the past have not been plugged, and much damage has been done by the water from a non-producing horizon passing through an old abandoned well to a producing horizon. It is therefore absolutely essential, for economic production, to properly plug all wells.

Competition plays an important part in the economical use of gas wells. To meet this condition, wells may be classified into five classes, as follows:

"A" wells or those directly offset by competitors. All wells falling in this class should be used continuously if possible.

"B" wells or those 1000 to 2000 ft. from competition, or wells near an open unoperated lease.

When the "A" wells do not supply the required amount of gas, then the "B" wells should next be used.

"C" wells or those 2000 to 3000 ft. from competition. These are third choice wells.

"D" wells or those thoroughly protected from competition.

"D" wells are only used for peak loads and emergencies. They are held in reserve nearly all the time.

"E" wells or those of special character. Rock pressure too high to shut in, or a high royalty well, or a large consumer of free gas, a defective well, etc.

Since the natural gas business is seasonable, the above method of using wells should prove to be very efficient. One of our large producers uses its wells less than 50 per cent of their possible productive time. It is also a fact that the amount of gas produced during a year is considerable less than 20,000 cu.ft. per day, per well, when averaged for 365 days.

After a group of wells have become depleted and can no longer be operated at a profit, it may still play an important part in our production picture. The area may be utilized as a storage field in which to store gas during the summer months from the highly competitive wells, for the purpose of using this gas as needed during the winter months. In the future, many depleted fields will be used for the storing and mixing of natural and artificial gas.

Cooking By Man-Made Gas Passes Century Mark

THE 100th anniversary of the first recorded use of manufactured gas for cooking purposes, which consisted simply of a spit that revolved in front of a gas jet, is celebrated with 1930.

It was not until twenty years later that the first gas range was devised, although little use was made of gas ranges until after the Centennial Exposition in Philadelphia in 1876.

A recent survey indicates that the American public purchased 1,130,000 new gas ranges during 1929, while nearly 50 per cent of the nation's families now depend on gas for cooking.

A Correction

IN the last issue of the A. G. A. MONTHLY, David B. Kahn was listed as the nominee for vice-chairman of the Manufacturers Section of the American Gas Association, whereas the name should have been David F. Kahn. The MONTHLY hastens to make this correction. Mr. Kahn is president of the Estate Stove Company, Hamilton, Ohio.

Hot Water and Health*

By W. H. REDDEN, M.D.
Cleanliness Institute

INFLEXIBILITY is the first sign of senility and most people die of mental sclerosis, long before old arterioclerosis rings down the curtain.

Even a crab changes its shell to keep pace with its growth, and when it ceases to change its shell, death is just around the corner.

A very intelligent man told me not long ago, that he refused to use a fountain pen, because he was convinced that the old-fashioned nib gave better service.

There are thousands of men who still use the old-fashioned razor, and even carry around a whole case of razors, one for every day of the week, in spite of the obvious safety and increased facility in the use of the safety razor.

Thousands of people still die each year in this country, from typhoid fever, smallpox, and diphtheria, because minds are fixed, because they themselves or others responsible do not believe in the germ theory, or the protective power of vaccines and antitoxins.

It is this same inflexibility of mind which constitutes the highest and most resistant barrier to progress and to the development and acceptance of new ideas. This is the reason why millions of people still fail to recognize the health and safety value of *Hot Water on Tap,* or a continuous, generous supply of this effective germicide under perfect control.

Dr. William H. Park, the noted bacteriologist and health authority, recently said to me: "I think no germ pathogenic to men can remain alive if boiling water actually reaches it for even an instant."

Hot Water on Tap under control has undoubtedly played an important part in producing increased safety in the home. Year in and year out about 28 per cent of all accidental deaths result from injuries received in the home. Out of 25,000 fatal home accidents in 1827, 9,400 were among children under fifteen years of age. More of these children died of burns and scalds than from any other kind of accidental injury in the home. This, however, is not the fault of hot water or heat but rather the fault of handling hot water or heat.

As long as hot water for dishwashing, personal or clothes washing has to be transferred from the tea kettle, the boiler or the tank to the sink, the basin, or the tub, just so long will scalds take their large toll of human life, as hot water is spilled or splashed onto human flesh as the result of slipping, stumbling over toys or children, etc. Of course, the floor is no place for a wash tub, and the table no place for the dish pan. For the place for washing dishes is at the sink and the place to wash clothes is either in set tubs or in tubs fixed so that children cannot fall into them or pull them over. The place to have hot water is at the point at which it is to be used, as far as this is humanly possible. Certainly, there can be no question that modern methods of producing and distribution of hot water have decidedly lessened scalding and accidental death due to scalds in the home.

Let us now consider the question of health. Hot water is one of the most important barriers against the spread of disease producing organisms.

For years health departments used fumigation as a means of terminal disinfection, after contagious diseases. Today, it is recognized by important health authorities that thorough cleaning with soap and hot water turns the trick.

Man becomes ill or dies, chiefly from diseases produced by germs. Ninety-two per cent of the germs of these diseases enter the body through the nose or mouth. This causes 22 per cent of deaths due to all illnesses. Over 60 per cent of all absenteeism in the shop, the school and the office, is the result of respiratory diseases alone, and common colds alone are the chief cause of absenteeism among the same groups.

These disease germs are passed from person to person in sputum or waste products, from kidneys or intestines, either by direct contact or by indirect transfer. We have no time to discuss every route, but let us consider some of the methods.

Hands: In 1929, Leila I. Givin conducted an experiment on the transfer of bacteria by hands in handshaking. After thoroughly cleansing the hands of 98 students with soap, water and a brush for five minutes, followed by rinsing and drying, bacterial cultures were spread over the palm of the right hand of some of the members of the group, then a system of hand shaking was carried out so that each person shook hands with a person first contaminated, or with others who were 2, 3 or 4 times removed from the contaminated person. Cultures were taken from all right hands. Results: Bacteria were transferred from the hand of one person to another directly or indirectly in 36.0 instances or about 36 per cent. Certainly this is definite proof that bacteria were passed from person to person by way of hand shaking.

Many diseases producing bacteria leave the body of infected people by way of the excreta from intestines or genito-urinary tract; as a result the hands readily become contaminated. Yet, how many people wash the hands carefully after the toilet. A careful observation made at Teachers' College of Columbia University, showed that twenty-seven out of a hundred women had left the toilet without washing the hands. Remember this happened among a selected group of intelligent people.

Such diseases as typhoid fever and dysentery are spread by people who carry the specific germs of these diseases in excreta from kidneys or intestines. What happens when such carriers fail to wash their hands thoroughly after toilet, then shake hands with others or prepare or handle food to be used by others?

Such diseases as pneumonia, scarlet fever, diphtheria, and meningitis are spread by people who carry the specific germs of these diseases in their nose, mouth or lungs. Now what happens when such carriers cough or sneeze into their hands, then shake hands or handle innumerable things which

* Paper read before New England Gas Sales Conference.

others may touch? What happens when such people either healthy or sick use eating utensils in common with others, or wipe on a towel used by others? What a free ride those germs must get! What a snap these have in finding new abiding places with no rent to pay!

Dr. John E. Walker has demonstrated that ordinary toilet soaps used with cold water concentrations produced by moderately careful lathering kills the germs of syphilis, diphtheria, pneumonia, epidemic meningitis, gonorrhoea, as rapidly as a two per cent carbolic acid solution. He further shows that with increased temperature of water there is a marked increase in the germicidal action. This was to be expected since the germicidal action on all materials is increased by increase in temperature.

Careful and frequent handwashing with plenty of soap and running hot water, especially after toilet and before eating, constitutes one of the most effective barriers man can use against the spread of disease-producing germs.

Dishes: The problem of dish-washing is one of the most important in the control of such diseases as influenza, colds, pneumonia, and other respiratory diseases for here such utensils as forks, spoons, rims of cups and glasses come into direct contact with the mouth and sputum, and unless properly cleansed carry their load of saliva and germs to the mouths of others. There is abundant evidence that such a free transfer occurs. Eating utensils in schools, hospitals, hotels, restaurants and soda fountains have been repeatedly cultured by laboratory workers. They have found always an abundance of germs on such utensils, as they are handed out, supposedly clean, for customers to use.

In scoring public eating places according to the number of germ colonies which develop in cultures taken from eating utensils the following results were observed:

In Dayton, Ohio, 27 per cent were excellent, and 32 per cent poor or bad.

In Philadelphia, out of 77 places cultured, feeding 60,000 people, only nine per cent rated excellent and 55 per cent poor and very bad.

In New York, where I conducted the experiment, out of 40 places cultured, feeding 30,000 daily, eight per cent rated excellent and 60 per cent poor or very bad.

We are therefore compelled to believe that unless eating utensils are properly washed before re-use they may well be comparable to common drinking cups on the transfer of communicable disease organisms.

But let us investigate more carefully. J. R. Wells, at the University of Chicago, in 1921 performed the following experiment. He cultured groups of cups, forks and spoons from the same sources as follows:

1st Group Unwashed
2nd Group Washed
3rd Group Scalded
4th Group Dried with towel after washing and scalding.

Results: Unwashed cups showed an average of 924 colonies!

	Forks	220
	Spoons	270
Washed	Cups	80
	Forks	40
	Spoons	51

A decided drop.

Scalded after washed

Cups	4
Forks	7
Spoons	5

Another terrific drop, but more important, not a single utensil showed a disease-producing organism, as far as man is concerned.

Dried after washed and scalded

Cups	17
Forks	16
Spoons	46

A decided increase due to wiping.

In other words, wiping with a towel adds germs to eating utensils. Probably, this is due to the fact that towels rapidly collect bacteria from excess dish water, successive dishes wiped and from the hands of the wiper.

Answer: The use of plenty of scalding water on dishes after washing builds an effective barrier to the transfer of bacteria along the eating utensil route. If hand drying is to be used, dish towels must be kept scrupulously clean, otherwise they may help to undo the good work of cleansing and scalding.

In my New York investigation, I found that soda fountain glasses were swished in a tank of soap and lukewarm water, then swished in a second tank of lukewarm water and rinsed in a cold water spray. The speed with which these glasses passed through this dampness from the lips of one person to the lips of another depended upon the load of customers served at the time. The cultures from such glasses showed an enormous number of bacterial colonies. And even glasses taken from high-class hotels showed high colony count. Why? Because glasses are washed only a little more carefully there than at soda fountains, Reason: Fear of breakage.

During my investigation, I took the temperature of both wash and rinse waters and recorded the exact time dishes were exposed to these temperatures. Now, the city law requires that glasses be exposed to a water temperature of 170° F. for two minutes or 180° F. for one minute. Yet, in not a single hotel, restaurant, soda fountain or lunch room did I find glasses exposed to a temperature of even 130° F. and in most cases the exposure was for less than two minutes.

Conclusion: All dishes can be made safe by careful washing in water at about 120° F. with plenty of soap, then a rinse by immersion in a rack into water at 180° F. to boiling for a minute, then air dried, or even a rinse by pouring scalding water over the dishes provided the scalding water reaches all surfaces.

If all dishes were carefully scraped free from food remnants then rinsed under running water, hot or cold, depending on whether milk, egg or other type of food has been on the dish and then washed in warm water and soap, rinsed and dried as suggested above; if the same precautions were taken with the cleansing of all dishes as one would take for dishes used by scarlet fever or diphtheria patients one of the finest barriers would be built in the home and in public eating places to prevent the spread of all epidemics and all contagious diseases, including pneumonia, common colds, and influenza, which take a far greater toll of life, which produce an infinitely greater amount of suffering and economic loss than the so-called children's diseases against which we fight so valiantly.

Clothing: The less we wear the more soiled the skin and the clothing next to the skin, for the slightest dust and bacteria-ladened breeze that blows readily hustles its burden through to the undies. Hence, the greatest need for more frequent washing of underclothing, and the body. One of the main reasons families waited for Blue Monday for the family wash was because to produce hot water in quantity was a burden so great that everything had to be set aside for the tank, even dispositions. But with hot water on tap at all times it is easy to wash out much of the clothing from day to day. This more frequent washing produces cleaner clothes without the scrubbing board. Most clothing and linen should never become so soiled that elbow grease and boiling are needed. Save yourself and save your clothes by frequent washing. This is the song of Hot Water on Tap. Standards of cleanliness in regard to towels, bathing suits and people are established by the A.P.H.A. and Conference of State Sanitary Engineers.

(a) It is desirable at artificial pools that suits and towels be supplied and cared for by the management. If individual suits are permitted they should be laundered and stored at the pool by the management.

(b) All suits and towels must be washed with soap and boiling water, rinsed and thoroughly dried each time they are used.

(c) Cold water and air drying should be prohibited. The use of a disinfectant on suits and towels in place of proper laundry methods is a makeshift which should not be permitted.

Personal Regulations: All persons using a swimming pool must be required to take a cleansing shower bath in the nude, using warm water, and soap. A bather leaving the pool to use toilet should be required to take a second cleansing bath before returning.

What does this mean? It means that health authorities recognize the fact that skin infections are readily transferred from persons, to towels, to clothing, to equipment, to swimming pools, and that unless proper care is taken to build barriers against the germs of infection the pools would have to be closed. It means that if a pool is to be made reasonably safe the bodies of all who use it must be as free as possible from body discharges which may be infected.

In spite of all these precautions, 50 per cent of the population is suffering from epidermophytosis or ring worm of the feet, and points upward. Cause: The tineo trychophyton maintains chief residence in the nice warm moist spot between the little and next toes, with warm weather it spreads, causes itching, produces blisters, then people scratch with finger nails, and towels or toes, and pass the organisms along to any part of the feet or the skin surface anywhere. Not only this, but floors of locker rooms and shower rooms, of bathrooms and of swimming pools, become contaminated. So also bath towels, bath mats, and more feet and even rugs and carpets, in the home, are infected as people walk with bare wet feet.

Hot water does not kill the resistant forms of this organism. But proper care of the feet, including frequent soap and hot water soaking and scrubbing, play an important part. Careful flushing of floors with hot water, after careful scrubbing with soap and hot water, help to put these organisms on the run.

Hands and Skin: In all industries using cutting oils thousands of workers have suffered and are suffering from industrial dermatosis; a definite, painful unsightly skin condition, which attacks hands, forearms, face and neck, or other parts of the body which come in frequent contact with the soiled hands. The U.S.P.H. Service investigating the condition among many industries discovered that this disease was due to the fact that workers covered hands and arms with oil without first washing the skin, and that during the day's work the original dirt on the skin was ground into the pores and about the hairs, that infection followed thus producing the dermatosis.

Chief Remedy: A thorough washing of the hands and arms before work and at lunch time, with soap and hot water and a scrubbing brush cleared up 75 per cent of the cases—and the same procedure under inspection prevented the occurrence of the disease among others.

Skin kills germs, especially if you remove grease and dirt with soap and warm water.

Dr. Lloyd Arnold, Professor of Bacteriology of the University of Illinois, of Chicago, has demonstrated that the skin and even the finger nails have a definite germicidal action, but that the germicidal action is greatly increased when the film of oil and soil is removed by soap and warm water.

The Wash Bowl: One of the most antiquated bits of bathroom equipment is the plug in the wash bowl. Try and find wash bowl plubs among the most progressive industries! Running water at the proper temperature is the rule. Reason: The wash bowl is a fine collector of industrial poisons which are washed from the hands and an equally fine museum for bacterial specimens from noses, mouths and skins of innumerable washers.

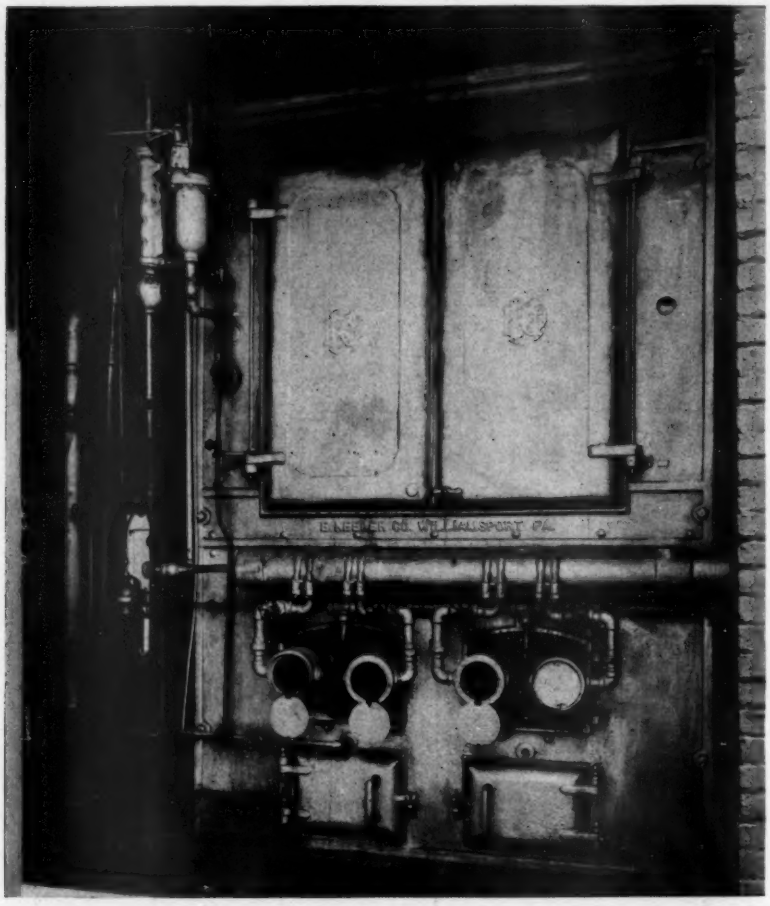
What happens to your wash bowl in the home? Mother, sister, brother and the boss, wash, clean teeth, spit and blow their noses freely into the bowl—with only a swish of water and a soiled towel between each user. Need I say more to give you the picture? *Remedy:* Clean teeth over the hopper and spit only in the hopper. Blow nose into handkerchief. Clean and scald out the bowl after you use it, and before you use it. Hot water on Tap again helps to save the day.

Better still will be the day when face and handwashing and even body washing except for a weekly soap will be done under running water coming through a single faucet with temperature properly regulated. You smile—but do you know that millions of workers in the dirtiest industries today are doing just that because it is good business? How long will it take to sell the idea to schools and homes?

Fatigue: Physical and Mental: The man who takes a warm cleansing shower after work and changes into street clothes, goes home with a decided relief from the fatigue of the day. He also gives his skin a transition from the heat and sweat of toil which makes him better able to resist chilling and contraction of respiratory diseases.

It is common knowledge that there are few procedures that can take out the pains, aches and tired feeling so

(Continued on page 374)



Gas-fired steam boiler from which the asphalt plant is operated

Gas-Fired Boiler For Asphalt Handling

By J. B. NEALEY
American Gas Association

IN preparing asphalt for surfacing roads steam lends itself admirably for melting, mixing and handling at the plant. In the City of Pittsburgh, Pa., gas fuel is used under the boiler at the Municipal plant No. 2 instead of coal, in spite of the fact that the latter is available at $2.70 per ton delivered. With gas at 45 cents per 1,000 cu.ft. it has been found to be cheaper than coal. It eliminates four firemen and the necessary laborers for coal and ash handling while the storage space for coal and ashes is available for this purpose.

The Pittsburgh asphalt plant No. 2 furnishes, on an average, 150,000 sq.-yds. of 3-in. asphalt surface in eight months. This is usually composed of 1½ in. of binder consisting of asphalt, sand and slag and 1½ in. of top composed of asphalt, sand and lime. The average cost is $1.66 per sq.yd. including overhead and depreciation of plant and equipment, etc.

Cars of asphalt are spotted on a railroad siding close to a pump house and a steam line is attached to the steam coils in the car and steam admitted. It requires from 6 to 12 hours to soften up the asphalt. A steam jacketted flexible hose is then attached to a bottom outlet in the car and suction applied with a steam pump which draws the asphalt through the hose, through a strainer in the pump house and on up into the storage tanks. There are two steel storage tanks of 80 tons' capacity each, and it requires only 60 minutes to unload a 40-ton car.

A steam crane with a grab bucket, operating on a parallel track, is used to unload sand, slag, lime, etc., which is stored in piles on the opposite side. The lime dust, however, comes in bags and this is taken by an elevator conveyor up into a storage bin holding 40 bags. In fact all of the ingredients are held in elevated storage bins and dropped by gravity directly into the mixers.

The sand is first dried in a revolving steel drum enclosed by a brick furnace. The drum, which is water operated, is 26 ft. long and 5 ft. in diameter and makes 6½ revolutions per minute. It sets at a slight angle so that the sand works through and discharges automatically. Heat is supplied by four atmospheric gas burners, and the temperature is maintained at 500° F. with the aid of a recording pyrometer. The capacity of this dryer is 40 tons hourly. The sand discharges into a chute which protrudes through the side of the furnace wall and directs the sand into a bucket elevator. This lifts it and drops it through a screen into a storage bin. Another dryer, identical to the one described, is used for drying the stone or slag.

Batches of 1500 pounds each are made up by drawing the sand, slag and lime from storage into weighing hoppers and the asphalt into buckets holding the correct amount. These ingredients are then dropped into the mixers. The asphalt tanks are equipped with steam coils and when ready to use the steam is turned on and the asphalt melted, 330° F. being the flowing temperature. Compressed air from a steam-operated compressor is admitted to the tanks through pipes and this forces the liquid asphalt out into the buckets.

The usual 1500-lb. batch for the top coat will contain 150 lbs. of asphalt, 270 lbs. of lime dust and 1080

lbs. of sand. There are other mixtures but this is the one most commonly used. The sand is used out of storage as soon after coming from the dryer as possible so as to preserve the heat but the lime dust is dumped in cold. These are weighed out in the weighing hopper and then dumped into the mixer with the asphalt.

There are two mixers built of steel plate about 5 ft. sq. and 3 ft. deep. They are jacketted so that steam can be admitted to keep the mixture up to temperature, about 500° F., equipped with two sets of heavy steel paddles on shafts. A 30-h.p. motor operates

Gas-fired rotary sand dryers. Note bucket elevators raising and charging sand into the retorts

both. The batches are dropped into motor trucks, holding about 9000 lbs. each, at a temperature range of 350 to 375° F. and are distributed within an average radius of 12 miles. From 10 to 12 trucks are thus employed.

The steam supply of this plant is furnished by a steam boiler of 150 h.p. capacity, which is fired with gas burners. This installation is of the Horizontal Return Tubular Suspension Boiler type fired with coal. However, for the sake of economy, gas burners were later provided and gas fuel has been used ever since.

The boiler is 72 in. in diameter and 16 ft. long and it is 52 in. from the floor level to the underside of the shell as shown in the side elevation. The burners are set in a firebrick wall

Drawing of tubular boiler that was later converted to gas firing

which blocks the fire door opening. There are four of these burners and they are manifolded to a single header. All metal surfaces exposed to the heat are protected with a refractory material excepting only the water-lined surfaces.

As air must be admitted and premixed with the gas in a predetermined ratio for perfect and complete combustion, the firebox is sealed airtight. The admission of air is provided for in the burners themselves through an adjustable shutter at one end of the burner mixing chamber. Gas is admitted to this mixing chamber through a series of small perforations, and the quantity is regulated by means of three regulating control valves. In addition to the economies effected through the use of gas fuel already mentioned, it is of interest to note that in the 15 years of service this boiler has undergone only once has it been necessary to change the tubes.

Mr. Kelly Named

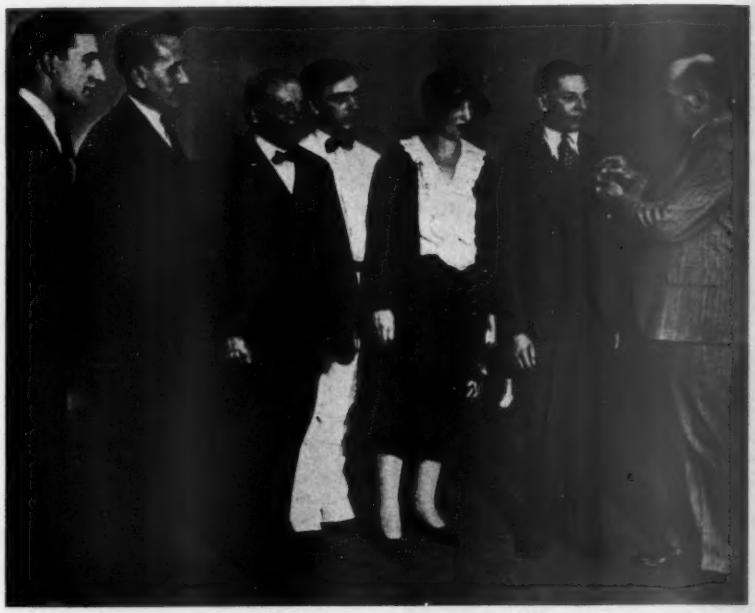
John Eoghan Kelly, consulting engineer of New York, has been elected director and vice-president of Midland Natural Gas Company.

Tank in which the asphalt is melted

Impressive Award of McCarter Medals

EVIDENCE of the efficacy of the Shafer Prone Pressure Method of Resuscitation was demonstrated June 3 when three medals—two McCarter Awards, offered by the American Gas Association, and another, tendered by the National Safety Council—were presented to three employees of the Equitable Gas Company, Pittsburgh, Pa., in the presence of the three persons whose lives had been saved.

This unusual ceremony took place during a first aid contest sponsored by the Equitable Company. The three who had been saved looked on. They are shown in the accompanying picture witnessing the presentation. Left to right they are: Carl Winkler, who was saved by Eugene S. Farrall, who stands next to him; Adolph Goerlich, saved from carbon monoxide poisoning by William P. McKenna, who received the National Safety Council's President's Medal, and Mrs. Joseph A. Koerner, saved from gas poisoning by her husband. F. F. Schauer, vice-president and general manager of the company, shown at the right, is pinning a McCarter Medal on Mr. Koerner.



The Presentation.

A McCarter Bar and Certificate were presented to C. J. Ullrick, of the Central Illinois Public Service Company, for saving the life of a fellow-employee —Alfred W. Henriot. The award was made by E. F. Kelley, assistant to the vice-president of the company at an employees' picnic held at Mattoon, Ill., June 24. The ceremony was witnessed by about 600 employees and their families.

C. J. Ullrick

The distinction of winning the fifth McCarter Medal ever presented to a woman employee of a gas company fell to Miss Gertrude Smale, of the Consumers Power Company, Pontiac, Mich. Through her knowledge of the Prone Pressure Method of Resuscitation, Miss Smale was able to save the life of her father who had been overcome by gas.

Miss Smale

Another employee of the same company, George R. Bean, also was awarded a McCarter Medal for saving the life of Harold E. J. Pussehl, a fellow employee of Saginaw, Mich.

Presentation of the medals to Miss Smale and Mr. Bean was made on June 30 at the meeting of the Michigan Gas and Electric Association, in session at Mackinac Island, by C. W. Bennett, vice-president of the association.

G. R. Bean

Mr. Bennett, in presenting the medals, explained that they were offered by Thomas N. McCarter, through the American Gas Association, in recognition of the heroism of any person who saved the life of anyone overcome by gas by the Shafer Prone Pressure Method of Resuscitation.

Four Factors Give Natural Gas New Life

FOUR factors that have caused the rebirth of the natural gas industry, a few years ago considered moribund, are given by the Union Trust Company, Cleveland, in its publication, *Trade Winds*. They are:

1. The assurance of adequate supplies for a long period of consumption.

2. The assurance of a vast consuming market, because of the recognition of the merits of gas as an ashless fuel.

3. The development of improved and low cost methods for the manufacture of pipe and construction of pipe lines.

4. The entrance into the field of large financial and business interests, ready to develop the situation to the full extent of its possibilities.

Trend of Gas Rate Structures In the United States 1925-1930

By PAUL RYAN
Statistician, American Gas Association

AN analysis of the rate making practices of the gas utilities of the United States from 1925 to 1930 indicates two general trends of major significance to the industry at large. First a more widespread appreciation and use of rates embodying a scientific formulation of fixed cost principles, affording rates which are more equitable and better adapted to promote the gas business by inducing greater consumption, and second, a more general use of distinct rates for special classes of service, or a trend in the general direction of class rates.

Table 1 shows, for the manufactured gas industry in the United States, a classification of rates according to class of service and type of rate schedule in effect on January 1, 1925 and 1930. This analysis is based on rates as shown in American Gas Association Rate Lists Number 3 and 8. The various groupings of rate types or forms are substantially those embodied in the 1926 report of the American Gas Association Rate Structure Committee entitled "Principles of Rate Making for Gas Companies."

It should be noted that the classification General Service or Domestic rates, refers to the gas companies' basic rate applying to domestic or other sales. Optional domestic rates, particularly those involving the utilization of gas-fired water heaters, are given separate treatment in this analysis.

Referring to Table 1, it will be observed from the first column that Class 1 rates for General Service or Domestic uses have undergone striking and significant changes during this five year interval. For example, type 1 rates of straight line form applicable to domestic service dropped from 231 in 1925 to 125 in 1930, while block rates of type 3 increased from 459 to 473. The most significant change however occurred in type 4 and 5 rates, which embody a fixed charge in the cost of the first few hundred cubic feet. While this type of rate containing a straight line commodity charge after the initial charge for the first few hundred cubic feet increased from only 11 to 23, the number of such rates with blocked commodity charge after the initial charge for the first few hundred feet rose from 134 in 1925 to 300 in 1930.

While there was also some increase in straight service charge rates, the increase in two and three part demand rates applicable to domestic service is noteworthy.

The extent to which rates for special classes of service have increased may also be observed from the bottom line of Table 1. For example in 1925 the total number of House Heating or Class 2 rates was only 40, whereas in 1930 there were more than ten times this number or 440. The same general trends are apparent for rates applicable to other special classes of service.

Table 2 was compiled from the data of Table 1, and shows the percentage distribution by type of rate for the ten primary classes of service used in the analysis.

From the first column of Table 2 on Class 1 rates for General Service or Domestic uses, it will be seen that in 1925 straight line meter rates constituted 24.2 per cent of the total number of rates available for domestic service, but by 1930 this type of rate constituted only 11.5 per cent of the total number of domestic rates.

While block rates expressed as a proportion of the total domestic rates declined from 48.2 to 43.6 per cent, the proportion of rates embodying a fixed charge in the cost of the first few hundred feet and with blocked commodity charge rose from 14.1 per cent in 1925 to 27.8 per cent in 1930.

This analysis also indicates that in 1925 only 25.8 per cent of the domestic rates embodied fixed charge elements, but by 1930 this proportion had risen to 43.6.

In addition to this marked increase in the number of domestic rates reflecting the elements of fixed cost, there have also been significant changes in the number and amount of minimum bill provisions. In 1925 nearly 10 per cent of the total number of rates for domestic service had no minimum bill requirements, and of those with such requirements, the largest group, comprising 30 per cent of the total, had minimum bill of from 26 to 50 cents per meter per month. In 1930 only 6.5 per cent of the domestic rates were without minimum bill requirements, and the largest group, comprising nearly 35 per cent of the total, had minimum bills of from 76 cents to one dollar. The increases are most pronounced in the groups showing higher minimum bills, indicating a general increase in the minimum bill provisions of the industry as a whole during this period.

The number of prepayment rates in use by the industry has shown a marked decline during this period. It is of interest to note that in many cases where prepayment rates have been retained, they have been supplemented either by direct service charges as such or some sort of minimum bill provision.

While there are still few demand rates applying to domestic service, the use of such demand rates for the other classes of service has shown a marked increase during the period. This is especially true of the rates for house-heating service, where the number of demand rates increased from 7 in 1925 to 164 in 1930.

TABLE 1

COMPARISON OF MANUFACTURED GAS RATES IN EFFECT ON JANUARY 1, 1925 AND JANUARY 1, 1930

Classification of Rates According to Class of Service and Type of Rate Schedule

Manufactured Gas Industry in the United States

Rate Type No.	Type of Rate	CLASSES OF SERVICE																							
		Class 1 General Service or Domestic Rates		Class 2 House Heating Rates		Class 3 Industrial Rates		Class 4 Commercial Rates		Class 5 Industrial and Commercial (Wholesale) Rates		Class 6 Water Heating Rates		Class 7 Commercial or Building Heating Rates		Class 8 House-heating and Industrial Rates		Class 9 Off Peak Industrial and Commercial Rates		Class 10 Special Domestic Rates Available Only to Customers Using Gas-Fired Water Heaters		Class 11 Miscellaneous Rates		Total Number of Schedules for All Classes of Service	
		1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930
1	Straight Line Rate	231	125	7	133	12	4	5	6	1	6	1	8	0	1	1	1	0	1	0	0	0	0	258	285
2	Step Rate	14	12	0	0	3	6	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	17	21
3	Block Rate	459	473	6	51	46	72	4	10	0	20	1	7	0	11	0	1	0	2	0	19	0	5(b)	516	671
4	Block Rate with Small Initial Block Constituting Minimum Bill and Remainder of Schedule of Straight Line Form	11	23	2	15	0	2	0	0	0	3	0	1	0	4	0	0	0	0	0	6	0	0	13	54
5	Block Rate with Small Initial Block Constituting Minimum Bill and Remainder of Schedule of Block Form	134	300	12	26	2	13	1	12	0	15	0	6	0	1	1	5	0	2	0	14	0	0	150	394
6	Service Charge plus Gas at Straight Line Rate	36	41	0	14	5	1	0	0	0	0	0	2	0	1	0	0	0	2	0	1	0	0	41	62
7	Service Charge plus Gas at Block Rate	61	74	1	20	8	14	0	1	0	5	0	9	0	1	0	1	0	0	0	12	0	0	70	137
8	Service Charge plus Gas at Step Rate	3	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
9	Two Part Demand Rate	3	18	3	125	17	73	0	16	4	49	0	7	0	15	0	4	0	2	0	2	0	0	27	311
10	Three Part Demand Rate Rate	1	14	4	39	10	23	0	3	5	17	0	0	0	0	1	4	0	1	0	0	0	0	21	101
11	Wright Demand Rate	0	3	5	17	0	21	0	2	1	0	0	13	0	1	0	0	0	0	0	22	0	0	6	79
	Flat Rate	0	0	0	0	0	0	0	0	0	0	0	2(a)	0	0	0	0	0	0	0	0	0	1(c)	0	3
	Miscellaneous Rates	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	GRAND TOTAL	953	1084	40	440	103	231	10	51	11	118	2	55	0	35	3	16	0	10	0	76	0	6	1,122	2,122

(a) Flat rates based on demand (b) Garage heater rates (c) Flat monthly charge for gas refrigerator

(c) Flat monthly charge for gas refrigerator

TABLE 2

COMPARISON OF MANUFACTURED GAS RATES IN EFFECT ON JANUARY 1, 1925 AND JANUARY 1, 1930

Percentage Distribution of Rates for Each Class of Service According to Type of Rate Schedule

(This table is based on data shown in Table 1)

Rate Type No.	Type of Rate	CLASSES OF SERVICE																							
		Class 1 General Service or Domestic Rates		Class 2 House Heating Rates		Class 3 Industrial Rates		Class 4 Commercial Rates		Class 5 Industrial and Commercial (Wholesale) Rates		Class 6 Water Heating Rates		Class 7 Commercial or Building Heating Rates		Class 8 House-heating and Industrial Rates		Class 9 Off Peak Industrial and Commercial Rates		Class 10 Special Domestic Rates Available Only to Customers Using Gas-Fired Water Heaters		Class 11 Miscellaneous Rates		Total Number of Schedules for All Classes of Service	
		1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930	1925	1930
1	Straight Line Rate	24.2	11.5	17.5	30.2	11.6	1.7	50.0	11.7	9.1	5.1	50.0	14.5		2.8	33.3	6.3		10.0		0.0		0.0	23.0	13.4
2	Step Rate	1.5	1.1	0.0	0.0	2.9	2.6	0.0	2.0	0.0	1.7	0.0	0.0		0.0	0.0	0.0		0.0		0.0		0.0	1.5	1.0
3	Block Rate	48.2	43.6	15.0	11.6	44.7	31.2	40.0	19.6	0.0	17.0	50.0	12.7		31.4	0.0	6.3		20.0		25.0		83.3	46.0	31.7
4	Block Rate with Small Initial Block Constituting Minimum Bill and Remainder of Schedule of Straight Line Form	1.1	2.1	5.0	3.4	0.0	0.9	0.0	0.0	0.0	2.5	0.0	1.8		11.4	0.0	0.0		0.0		7.9		0.0	1.2	2.5
5	Block Rate with Small Initial Block Constituting Minimum Bill and Remainder of Schedule of Block Form	14.1	27.8	30.0	5.9	1.9	5.6	10.0	23.5	0.0	12.7	0.0	10.9	*No Schedules in 1925*	2.9	33.3	31.1	*No Schedules in 1925*	20.0	*No Schedules in 1925*	18.4	*No Schedules in 1925*	0.0	13.3	18.6
6	Service Charge plus Gas at Straight Line Rate	3.8	3.8	0.0	3.2	4.9	0.4	0.0	0.0	0.0	0.0	0.0	3.6		2.9	0.0	0.0		20.0		1.3		0.0	3.7	3.0
7	Service Charge plus Gas at Block Rate	6.4	6.8	2.5	4.5	7.8	6.0	0.0	2.0	0.0	4.2	0.0	16.4		2.9	0.0	6.3		0.0		15.8		0.0	6.2	6.5
8	Service Charge plus Gas at Step Rate	0.3	0.1	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.3	0.1
9	Two Part Demand Rate	0.3	1.6	7.5	28.4	16.5	31.6	0.0	31.4	36.4	41.5	0.0	12.7		42.9	0.0	25.0		20.0		2.6		0.0	2.4	14.7
10	Three Part Demand Rate	0.1	1.3	10.0	8.9	9.7	10.0	0.0	5.9	45.4	14.4	0.0	0.0		0.0	33.4	25.0		10.0		0.0		0.0	1.9	4.7
11	Wright Demand Rate	0.0	0.3	12.5	3.9	0.0	9.1	0.0	3.9	9.1	0.0	0.0	23.7		2.8	0.0	0.0		0.0		29.0		0.0	0.5	3.7
	Flat Rate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6		0.0	0.0	0.0		0.0		0.0		16.7	0 0	0.1
	Miscellaneous Rates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0		0.0	0.0	0.0		0.0		0.0		0.0	0.0	0.0
	GRAND TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		100.0		100.0		100.0	100.0	100.0

Of the 164 demand house-heating rates, nearly one half, or 84, based the demand on square feet of installed or required radiation surface or some equivalent measure. Curiously enough, the next largest group of 35 based the demand charge on the maximum one hour demand, only 14 of the house-heating demand rates being based on the maximum 24 hour demand. The majority of the rates for other classes of service such as industrial, commercial, etc., also tend to use the maximum hour as the basis of the demand charge. Whereas the commodity charge for most of the house-heating demand rates was of the straight line form, in the case of the demand rates for other classes of service, the blocked commodity charge was more generally used.

In addition to the comparative analysis of manufactured gas rates for 1925 and 1930 shown in the tables previously discussed, natural gas rates contained in American Gas Association Rate List Number 8 as of January, 1930, were also analyzed, but lack of corresponding data for 1925 precluded analytical comparisons on natural gas rates for the five year period.

This study indicates relatively few rates for special classes of service other than the domestic or general service and industrial classifications, the former accounting for 58.3 per cent of all natural gas rate schedules and the latter comprising 31.8 per cent. This may be explained by the fact that in most natural gas territories, house heating and commercial uses are included under the general service rate.

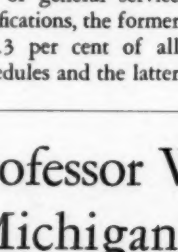
Straight line meter rates and block rates respectively, together comprise over 70 per cent of the total number of domestic schedules, while types 4, 5, 6 and 7 embodying elements of fixed cost, comprise less than 27 per cent of the total.

Nearly 27 per cent of the natural gas schedules applicable to domestic or general service requirements have no minimum bill provisions. However, of the schedules incorporating minimum bill requirements by far the largest number have minimum bills from 76 cents to one dollar, a situation similar to that found for the manufactured gas schedules.

While rates embodying a fixed charge in the cost of a small initial block (type 5) comprise less than 10 per cent of the natural gas schedules applicable to domestic or general service requirements, because of the rapidly increasing adoption of this particular form of rate by natural gas companies, it was accorded more detailed analysis. For the largest number of schedules in any one grouping, the fixed charge included in the first block is from 26 to 50 cents, or substantially the same figure prevailing among manufactured gas rate schedules of similar type.

Professor White Heads Michigan Association

RECOGNITION of thirty years outstanding service to the gas industry and to gas users through the guidance of research work and the training of gas engineers came to Professor Alfred H. White, head of the Chemical Engineering Department of the University of Michigan, July 2, 1930, when the Michigan Gas Association, in session at Mackinac Island, Mich., elected him president for the coming year. The honor thus conferred is unique in the thirty-seven years history of the organization for it is the first time that a person not actively engaged in the gas industry has been elected president.



Prof. White

Professor White graduated from the University of Michigan in 1893. He taught three years at the University of Illinois and studied a year at the Federal Polytechnic Institute in Zurich, Switzerland, before returning to the University of Michigan as instructor in chemical technology.

Two years later the Michigan Gas Association, on the initiative of Henry T. Walbridge, then manager of the Detroit City Gas Company, and Henry W. Douglas, of the Washtenaw Gas Company, instituted a cooperative program with the University of Michigan to encourage students desirous of becoming gas engineers and to promote research work in related fields. It was recognized that specialized work in gas engineering should be undertaken only as a graduate course and the first holder of this fellowship was Herman Russell, now president of the Rochester Gas and Electric Corporation.

The relationship thus commenced in 1900 has been maintained continuously, except for an interruption during the World War period. This fellowship in gas engineering supported at the University of Michigan by the Michigan Gas Association is the senior industrial fellowship in the United States.

During the thirty years in which research has been carried on under Professor White's direction, the gas industry has changed from a 90 per cent lighting service to a 92 per cent heating service. It is significant that some of the early holders of the fellowship studied such subjects as "Relation of Heating and Illuminating Values of Gases, Especially as Applied to Incandescent Mantles," "The Theory of the Incandescent Mantle," and "Loss of Illuminating Power of Mantles While Burning," while more recent holders of the fellowship have studied such industrial subjects as "The Influences of Gases Within the Oven on Baking Japans," "The Treatment of Brass in Neutral and Reducing Atmospheres," and "Gas as a Case-Hardening Agent; the Heat Treatment of Iron and Steel in a Neutral Atmosphere."

During the thirty years also, Professor White has sent out from the Chemical Engineering Department of the University of Michigan hundreds of gas engineers to take responsible positions in the gas industry, including the twenty-seven holders of the Michigan Gas Association fellowship.

Other officers elected by the Michigan association were as follows: J. E. Spindle, of the Grand Rapids Gas Light Company, vice-president, and Albert G. Schroeder, secretary-treasurer.

Affiliated Association Activities

Canadian Gas Association

A. T. Leavitt

THE twenty-third annual convention of the Canadian Gas Association was held at Halifax, N. S., June 24 and 25, K. L. Dawson of the Nova Scotia Light and Power Co., Ltd., Halifax, presiding.

Following the registration of nearly 100 delegates, the meeting was called to order in the convention hall at the Lord Nelson Hotel where a short address of welcome to the City and Province was tendered by the Mayor.

The president's address followed, was short and to the point, and put the members thoroughly at their ease; an outstanding feature of the president's address was his reference to the unusual growth in membership during the current year. The secretary-treasurer's report followed and from it was learned that the financial condition of the association was the best in its history, that there were many applications for the seals of the Canadian Gas Association Laboratory Approval Division and that 213 certificates had been awarded. It was also revealed that 286 manufacturers in Canada and the United States have adopted the seal of approval and in this connection the meeting was informed that the Montreal Light Heat and Power Consolidated carries advertisements relative to the seal of approval in both French and English.

The reports of committees were up to the usual high standard set by the Canadian Gas Association and covered the field of the industry through production, distribution along with research work to utilization and new business methods.

Where the standard is so uniformly high, comparison is invidious and reference to the excellent paper by the president dealing with his research and practical success in connection with utilization of local high-sulphur coals is selected for mention for the sole reason that facilities were made available for those in attendance to inspect the works and observe the procedure whereby this unusually high sulphur is removed.

The entertainment features were quite evidently in the hands of an active committee and included a concert and entertainment in the Public Gardens, drives and lunch for the ladies, to Dartmouth Links and Point Pleasant Park as well as an interesting and instructive trip around Halifax Harbor on a government boat.

The high point in the entertainment features was the annual banquet and dance held on Tuesday evening. During the banquet toasts—drunk in ginger ale—were proposed and responded to by various speakers as follows: King, Province of Nova Scotia, City of Halifax, Gas Industry, Nova Scotia Light and Power Company, the Ladies, the Press. President Dawson was ably supported by Mrs. Dawson who gracefully responded to the toast of the press.

An international aspect to the meeting was injected by the fraternal greetings and good wishes of the presidents and executive officers of the American, British and New Zealand Gas Associations which were presented by A. Gordon King and F. J. Kennedy, respectively; the greetings of the French association were received by cable.

The following officers were elected for the coming year:

President, A. T. Leavitt, president of the Hamilton By-Product Coke Ovens, Ltd., Hamilton, Ont.; first vice-president, Hugh McNair, manager gas utility, Winnipeg Electric Co., Winnipeg; second vice-president, Harry S. Williams, superintendent gas department, Board of Light & Heat Commissioners, Guelph, Ont.; secretary-treasurer, Geo. W. Allen, Toronto, Ont.

The Canadian Gas Association will hold its twenty-fourth annual convention in Montreal, June 4 and 5, 1931.

Wisconsin Utilities Association

THE annual Accounting Section convention of the Wisconsin Utilities Association, June 19 and 20, attracted 114 delegates from all parts of the State to Eau Claire, Wis. The meeting was considered the most successful and interesting yet held and many stimulating papers were contributed.

The section elected J. E. Gray, of the Wisconsin Power and Light Co., Madison, chairman, and named R. H. Macke, Wisconsin Valley Electric Co., Wausau, as vice-chairman.

The conclave opened with an address of welcome by G. V. Rork, division manager of the Northern States Power Co. H. M. Brundage, chairman of the Committee on Uniform Classification of Accounts of the American Gas Association, and vice-president of The Consolidated Gas Company of New York, delivered a vigorous talk in which he deplored the socialistic movement fostered by a small minority using subtly disguised methods.

M. H. Frank, president of the association, addressed a joint luncheon of the Kiwanis Club and the Accounting Section. He outlined the purposes of the association and brought out the increased effort of public utilities to reduce the cost of their service to the public. In a talk before the Accounting Section, L. F. Seybold, research engineer of the Milwaukee Electric Railway and Light Company, told of the decline in municipal ownership in the United States in recent years.

Educational opportunities for employees were discussed by H. P. Taylor, division auditor of Wisconsin Public Service Corp., Green Bay. Miss Mary A. McNulty, assistant auditor of the Wisconsin Power and Light Co., advocated educational work for women employees.

The winners of an essay contest conducted by the Women's Committee of the Wisconsin Utilities Association were announced as follows: Helen J. Welsh of the Northern States Power Co., first prize, a cash award of $50; Marion Croal of the Milwaukee Gas Light Co., second prize of $30; and Agnes Phillipson of the Wisconsin Public Service Corp., third prize of $20. The awards will be presented at the annual conference to be held in Milwaukee on September 19 and 20.

Pacific Coast Gas Association

THE thirty-seventh annual convention of the Pacific Coast Gas Association will be held in Pasadena, California, September 9 to 12. The Hotel Huntington will serve as headquarters. "Modernize with Gas" will be the convention theme, with essay contests, stunts contest and speaking contests for men and women on this subject.

General sessions are planned for Tuesday afternoon, Tuesday evening, Wednesday morning and Friday morning. Parallel sessions of sections will take place on Wednesday afternoon and Thursday morning. Special entertainment features of the convention will be a ball on Wednesday evening, a golf tournament on Thursday afternoon and visits to two exhibitions on Friday afternoon, the first dealing with modern distribution methods and the second with industrial utilization practice. A banquet is scheduled for Friday evening.

Empire State Gas and Electric Association

PLANS are being made for the twenty-fifth annual meeting of the Empire State Gas and Electric Association, which will be held at Saranac Inn, New York, Thursday and Friday, September 18 and 19, 1930. A program is being set up which will include addresses on commission regulation, trends of regulation, rates, utility investments, with messages from officers of the American Gas Association and the National Electric Light Association. The speakers will be men of prominence and authority, and the program is expected to be of special importance to executives.

Business sessions will occupy the morning of each day with the afternoon left open for golf, auto trips, walking and other forms of recreation. An entertainment and recreation program will be ar-

Convention Calendar

Pacific Coast Gas Association,
Hotel Huntington, Pasadena, Calif.
Sept. 9-12.

Empire State Gas & Electric Association,
Saranac Inn, N. Y.
Sept. 18 and 19.

Indiana Gas Association,
French Lick, Ind.
Sept. 23-24.

Illuminating Engineering Society,
John Marshall Hotel, Richmond, Va.
Oct. 7-10.

American Gas Association, Municipal Auditorium, Atlantic City, N. J., October 13-17, Alexander Forward, 420 Lexington Avenue, New York, N. Y., Managing Director.

Conference Utility Association Secretaries,
Cleveland, Ohio
Dec. 1 and 2.

New England Gas Association,
Hotel Statler, Boston, Mass.
Feb. 3, 4, and 5, 1931.

Canadian Gas Association,
Montreal, Que.
June 4 and 5, 1931.

National Electric Light Association,
Atlantic City Auditorium,
Atlantic City, N. J.
June 8-12, 1931.

ranged to include golf and bridge tournaments. Special sleeping cars will be provided from Buffalo to New York, and applications may be made to the association's office for space thereon. Hotel reservations should be made direct by writing to Saranac Inn, Saranac Inn Post Office, New York. C. H. B. Chapin, secretary, advises early reservations for this meeting.

Pacific Coast Gas Association

THE annual Northern Regional Conference of the Pacific Coast Gas Association was held in Seattle, Washington, June 26, 27 and 28. One hundred and thirty members of the association were in attendance, representing all of the operating companies in British Columbia, Oregon and Washington, and also several California companies.

The conference was in session continuously on the first two days of the meeting, the third day being devoted to an open meeting on the cooperative advertising program being conducted by the association, and to an outing for those not interested in this phase of the association's work.

A luncheon was served on June 26 and those present were addressed by several officers of the association and by a humorous speaker. A dinner dance was held on the evening of June 27, which was given over entirely to recreation and the enjoyment of a cabaret provided through the courtesy of Jas. F. Pollard, general manager of the Seattle Lighting Co., who acted as host.

The first business session discussion was directed toward the extension of gas service in rural territory through both the extension of existing distribution facilities for manufactured and natural gas, and the use of butane. Grant Reddick, of the Portland Gas and Coke Co., described how that company had extended its distribution mains to include the city of Salem which previously had had very inadequate gas service. The increase of business has been so marked that the company is now planning to further extend its transmission system into Albany and Corvallis by the construction of about sixty miles of transmission. Neither of these cities have previously had gas service.

C. E. Rutledge, of the Southern Counties Gas Co., described the results of extending natural gas service into Laguna Beach and San Clemente, in Southern California. These villages have both been advertised extensively by the electrical industry as "all electric villages" and it was true that the majority of the cooking and heating load was served by electric installations. Upon the initiation of natural gas service, however, the business has rapidly changed over to gas, showing conclusively that electricity cannot compete when gas is available at attractive prices.

J. H. Gumz, of the Pacific Gas and Electric Co., and F. A. Hough, of the Southern Counties Gas Co., discussed different phases of the butane situation in California, and both advised gas companies to make use of this product in extending their services into territory which cannot be profitably served by the main transmission system.

Great interest was manifested in the description of the Benton County, Washington, gas field by R. E. Combs, vice-president of the Northwestern Natural Gas Co., which is operating in this field.

Two sessions were held in the afternoon, one in the Accounting Section and one in the Technical Section. The second day of the conference was devoted to sales and new business matters.

Wisconsin Utilities Association

PLANS are progressing for the Women's Conference to be held in Milwaukee, September 19 and 20.

Some of the high spots of the meeting which can be announced at this time follow: Miss Agnes Kinney, of the First Wisconsin National Bank, of Milwaukee, will speak on "Chain Banking"; Stephen Bialecki, Milwaukee Gas Light Co., will talk on "Credits," and Phil Grau, of Milwaukee, will address the meeting on "Contacts with Customers."

The Home Service Department of the Milwaukee Gas Light Company will serve tea at their new quarters on Friday afternoon, September 19, with Mrs. Ella Liner Lambert as hostess.

It is planned to have the three prize essays read by their authors, Helen Welsh, Marion Croal and Agnes Phillipson.

S. B. Way, president of the Milwaukee Electric Railway & Light Co., will welcome the conference to the city and President M. H. Frank will address the group.

Pennsylvania Natural Gas Men's Association

FROM all reports the annual meeting of the Pennsylvania Natural Gas Men's Association, held at Oil City, Pa., June 26 and 27 was a great success. The registration reached 302 and all four sessions were well attended, instructive and the discussions following each paper were actively participated in by various members of the convention.

United Natural Gas Company, having its general offices at Oil City, acted as hosts for the convention, and a large number of its personnel, including its president, George E. Welker, did everything for the convenience, comfort and entertainment of those attending the convention.

The City of Oil City, through its Mayor, T. L. Blair, extended a cordial welcome to the delegates and cooperated in every way possible in the entertainment of the visitors.

Some of the outstanding papers were by F. E. Vandaveer, A. G. A. Testing Laboratory, "The Place of the American Gas Association Laboratory in the Natural Gas Business"; W. H. Locke, vice-president, United Natural Gas Co., spoke on "Progress of the Natural Gas Industry in the Use of Gas for House Heating and Industrial Use"; J. French Robinson, geologist and engineer, Peoples Natural Gas Co., discussed "Gas Production Economy"; E. J. Kreh, Accident Prevention Bureau, Philadelphia, spoke on "Safety as Related to the Natural Gas Industry"; E. B. Nutt, Standard Oil Co., discoursed on "The Need of Current Accounting Data to Natural Gas Companies"; and C. E. Hinkley, United Natural Gas Co., spoke on what the gas com-

panies are doing along the lines of employee education.

Directors were elected for the ensuing year as follows: T. B. Gregory, vice-president, Columbia Gas & Electric Corp.; S. W. Meals, president, Carnegie Natural Gas Co.; B. D. Phillips, vice-president, T. W. Phillips Gas and Oil Co.; F. R. Phillips, president, Equitable Gas Co.; Geo. W. Ratcliffe, president, Manufacturers Light and Heat Co.; J. F. Robinson, geologist and engineer, Peoples Natural Gas Co.; E. S. Templeton, treasurer, Greenville Gas Co.; J. B. Tonkin, vice-president, Peoples Natural Gas Co.; George E. Welker, president, United Natural Gas Co.; Geo. E. Whitwell, vice-president, Equitable Gas Co.; Geo. Wittmer, Jr., treasurer, Wittmer Oil and Gas Properties.

Following the annual meeting the new directors met and elected officers for next year as follows: President, George E. Welker, president, United Natural Gas Co.; vice-president, J. F. Robinson, geologist and engineer, Peoples Natural Gas Co., and secretary-treasurer, B. H. Smyers, Jr., attorney, Equitable Gas Co.

"Water Heating"* Sixth In Industrial Series

"WATER HEATING," the sixth of the Industrial Gas Series, is a reference book on all phases of gas water heating, with particular reference to large volume applications. The following table of contents shows some of the material which is covered by this valuable book:

Chapter I. Economics of Water Heating

1. The Market for Gas Water Heating.... 5
2. Gas Water Heating All Year Round.. 7
3. Cost Analysis of Competitive Fuel Operation 8
4. Comparison of Gas and Coal Costs.... 12
5. The Combined Garbage Incinerator and Water Heater..... 14
6. Competition with District Steam..... 14
7. Competition with Oil Burners..... 15
8. Off-Peak Rates..... 15
9. Aids for Gas Sales..... 17

Chapter II. Water Heating Systems

10. The Hot Water Generator..... 19
11. Hot Water Storage Tanks..... 20
12. Hot Water Piping Systems..... 22
13. Flow of Water in Pipes and from Fixtures 28
14. Maximum Runs Practical Without Circulating Line..... 33
15. Overflow Piping..... 33

Chapter III. The Hot Water Requirements

16. Estimating the Hot Water Demand.... 34
17. Factory and Office Buildings..... 36
18. Water Consumption of Individual Appliances 37
19. Estimating Average Hot Water Consumption on Basis of Maximum Demand 38
20. Effect of Water Temperature on Water Consumption 38
21. Radiation Loss from Piping..... 39
22. Effect of Water Temperature on the Gas Consumption..... 41

Chapter IV. Gas Water Heating Equipment

23. The Cast Iron Boiler..... 43
24. Selecting the Storage Tank and Boiler for Indirect Systems..... 43
25. The Installation of Cast Iron Boilers (Gas designed and conversion)..... 49
26. Limiting Pressure on Cast Iron Boilers 55
27. Conversion Burners for Large Volume Water Heating..... 55
28. Heating Swimming Pools..... 59
29. The Multi-coil Heater..... 61
30. Selecting the Storage Tank and Copper Multi-coil Heater..... 61
31. Heating Water for Elevated Sprinkler and Supply Tanks..... 63
32. The Instantaneous Water Heater..... 66
33. Cost of Storage and Heater Capacity.. 68
34. Selecting Correct Type Heater for the Job 69

Chapter V. Efficiency of Water Heating

35. Thermal Efficiency of Water Heaters... 72
36. Effect of Partial Operation..... 72
37. Gas for Pilots 73
38. Overall Efficiency of Water Heating Systems 74
39. High Bill Complaints..... 75

Chapter VI. Water Heater Accessories

40. Pressure of Water..... 76
41. Pressure Reducing Valves or Regulators 76
42. Pressure Relief Valves..... 77
43. Types of Pressure Relief Valves..... 77
44. Vacuum Relief Valves..... 77
45. Temperature Relief Valves..... 78
46. Location of Temperature Relief Valves 79
47. Extra Tappings for Tanks..... 80
48. Thermostats 80
49. Flues 82

Chapter VII. Domestic Water Heating

50. The Private Home..... 87
51. Domestic Water Heaters..... 88
52. Installation of Tank Heaters..... 89
53. Efficiency and Capacity of Tank Heaters 90
54. Adjustment of Burners..... 91
55. The Non-Automatic Storage Water Heater 91
56. Automatic Storage Heaters..... 91
57. Semi-Automatic Water Heaters..... 92
58. Selection of Proper Size Heater..... 92
59. The Market for the Automatic Heater 94
60. The Direct Coal Heater..... 95
61. The Internal Furnace Coil..... 95
62. The External Coil..... 95
63. The Electric Water Heater..... 96
64. Fuel Consumption for Water Heating.. 97

Chapter VIII. Selling the Water Heater

65. Sales Approach to a Building Owner.. 101
66. Contact with Architects..... 103
67. Dealing with Building Operators..... 104
68. Dealing with Superintendent or Janitor 104
69. Cooperation with Dealers, Plumbers, etc. 104

Chapter IX. Case Histories

..... 107

Appendix .....

Robert S. Clarke, Jr., New York district manager of the Ruud Manufacturing Company, reviews the book as follows:

"Looking at the book from the viewpoint of the manufacturer, I think this fills a need for all salesmen. It has been our experience with multi-coil water heaters that the man who has the complete information regarding different types of heating units, conditions, comparison of operating cost of different fuels and a correct method for figuring large volume water heaters, is the man who has been, in the past, very successful in selling this type of equipment.

"In dealing with gas company representatives, I have found that the information which they have on this type of equipment has been, in the past, very limited, and they have been more or less dependent on manufacturer's representative for assistance in selling jobs of large volume types. If this book is used by gas company salesmen and studied thoroughly, I believe that it will be the means of securing quite a lot of volume water heating business for the gas companies concerned.

"While our work covers equipment of one nature, namely, copper coil water heaters, I think your treatment of the different types of equipment is very good.

"Our own men have been schooled quite intensively on volume water heating work, but with this book, and the complete information which it contains, I know they will have sufficient material to cover almost any type of work which they will get into, and they will be able to give an intelligent answer to almost any question which will be put to them. This will also be true of gas company salesmen, if this book is used properly."

* Water Heating, 128 pages, 9" x 12", 48 tables, 28 charts, profusely illustrated with line engravings and halftones showing many actual water heater installations, published by A. G. A.

Mr. Freeman Heads Providence Gas Co

F. C. Freeman

FREDERICK C. FREEMAN has been elevated from the vice-presidency to the presidency of the Providence Gas Company, Providence, R. I., succeeding the late Charles H. Manchester, who died suddenly last June. Mr. Freeman also was elected a director of the company.

For many years Mr. Freeman has been actively identified with the gas industry. He is a director of the American Gas Association and past president of the New England Gas Association.

A native of Jersey City, N. J., Mr. Freeman is a graduate of the Stevens Institute of Technology. He first entered the employ of The United Gas Improvement Company, Philadelphia, Pa., and later was associated with the Stacey Manufacturing Company, Cincinnati, O., as chief engineer. He became engineer of the Providence Gas Company in 1919 and was elected vice-president in 1923.

Personal and Otherwise

C. H. Geist

Clarence H. Geist and **Edward Hopkinson, Jr.,** have been elected directors of the United Gas Improvement Company, following the board's action increasing its number from fourteen to sixteen members. Mr. Geist has long been in the public utility field, having operated gas, electric and water properties serving more than five hundred municipalities, large and small. Mr. Hopkinson is a partner of Drexel & Company and J. P. Morgan & Company and was recently elected a director of United Corporation.

E. Hopkinson, Jr.

Allen Addicks, formerly of the editorial staff of *Gas Age-Record* and *Industrial Gas,* has been appointed Eastern representative of the firm of William H. Coburn & Company, investment bankers.

R. D. O'Neil has been appointed as engineering and sales representative of the American Meter Company, with headquarters at Birmingham, Ala.

Paul J. Kruesi was recently elected president of the American Lava Corporation of Chattanooga, Tenn., to succeed John Kruesi, deceased.

Walter H. Hoagland has resigned as local manager of the Central Gas Corporation at Henderson, Ky., to accept the position of gas sales supervisor of the Kentucky & Tennessee Light and Power Company, with headquarters at Bowling Green, Ky.

Arthur C. Frey has been made general manager of the Worcester Gas Light Company, succeeding Isaac T. Haddock, who recently became assistant general manager of the New England Gas and Electric Association.

James F. Tickner has been appointed manager of the new Pasadena, Calif., branch office of the Los Angeles Gas and Electric Company.

Math W. Thernes, formerly secretary of the Spokane Gas and Fuel Company, has been made manager of the Minneapolis securities office of Henry L. Doherty and Company.

William A. Sherman has been appointed a representative of the Springfield Gas Light Company, Springfield, O.

W. A. Bertke has succeeded Frank W. Budd as treasurer of the Central Indiana Gas Company with headquarters at Muncie, Ind.

Edward V. Jaeger, of Hornblower and Weeks, has been elected a director of Southwest Gas Utilities Company.

A. B. Paterson has been appointed president of New Orleans Public Service Inc., to succeed Herbert B. Flowers, who has retired from the presidency. Mr. Paterson has been vice-president and general manager of the local utilities company.

L. W. Mahaffey has joined the sales staff of the Pittsburgh Equitable Meter Company, Columbia, S. C., office.

J. Frank Stacey has joined his brothers in the management of The Stacey Bros. Gas Construction Company.

C. E. Jones, manager of the Rome, Ga., office of the Georgia Public Utilities, has been transferred to the Atlanta office.

L. H. Knapp has been appointed chief industrial service engineer of the Blackstone Valley Gas and Electric Company to succeed F. H. Simmons who resigned to accept a position with the Henry and Wright Machine Company.

Joseph P. MacSweeney has been promoted to supervise the system-wide merchandising operations of the Associated Gas and Electric Company. Frank Huestón will take Mr. MacSweeney's position in the Rochester, N. Y., offices.

Glenn C. Wilhide has been appointed manager of the Portsmouth Gas Company, Portsmouth, O., succeeding Homer R. Rogers, who resigned.

Herman M. Palmer, assistant manager of commercial office of the Associated Gas and Electric Company at Oneonta, N. Y., has been promoted to manager of the commercial office at Geneva, N. Y.

A. E. Peat, for seventeen years treasurer and comptroller of the Southern California Gas Company, has resigned to accept the position as chairman of the board of McEverlast, Inc., in Los Angeles, manufacturers of pipe coating and paving products.

Hughes B. Davis, field manager of the customer ownership department of the Gas Service Company, has been appointed securities sales manager of the Chicago District.

W. C. Mead, of the Ohio Fuel Gas Company, has been promoted to local manager at Mansfield, O., and assistant manager in the district. He succeeds A. H. Lewis, who was transferred to the Columbus office of the company.

George G. Shallenberger, formerly president of the Kansas Osage Gas Company and vice-president of the Marland Refining Company, has become associated with the Foreman-State Corporation. Mr. Shallenberger is in the underwriting department and specializes in natural gas industry.

Walter Hendricks has been appointed supervisor of Electrolux refrigeration sales at Toledo, Ohio.

R. H. Sheldon has been elected president of the Brockton Gas Light Company Mutual Benefit Association.

W. H. Barthold, of New York, was elected president of the Southern Indiana Gas and Electric Company at the annual meeting of the stockholders. J. A. Brown and C. E. Oswald were added to the board of directors.

John M. Kline has been appointed sales manager of Martinsburg Heat and Light Company.

E. D. Alexander, since 1913 vice-president of the Illinois Northern Utilities Company, has been elected president of the company, succeeding Martin J. Insull. George B. Fleuhr, formerly district manager at Freeport, succeeds Mr. Alexander as vice-president.

Mord M. Bogie has been appointed sales manager of H. M. Byllesby and Company in charge of the company's western division offices. Guy Hoffer has been made assistant sales manager of the western division.

Walter H. Hoagland, a gas heating engineer, has been placed in charge of the appliance department of the Central Gas Corporation, Henderson, Ky.

W. H. White and **Joshua Green,** of Seattle, Wash., have been elected to the board of directors of the newly named Seattle Gas Company, formerly the Seattle Lighting Company.

D. M. Wallington has been placed in charge of the merchandising department recently organized by the Public Utilities Corporation of Arkansas, operating as a subsidiary of the Arkansas Natural Gas Corporation, at Conway.

Miss Dorothy G. Clock has been named to take charge of the newly formed Home Service Department of the Kansas City Gas Company, Kansas City, Mo.

John F. McQuillin, of the New Business Department, Wyandotte County Gas Company, Kansas City, has been transferred to Sabetha, where he will have charge of the New Business Department of the new gas company in that city, a Gas Service subsidiary.

Paul J. Herold, of Yale, Waters and Company, investment bankers, has been elected a director of the Appalachian Gas Corporation, the Texas Gas Utilities Company and the Southwest Natural Gas Company.

Horace B. Merwin has been elected to the board of directors of the Bridgeport Gas Light Company to fill a vacancy created by the death of Charles G. Sanford.

Alvin Johnson has been made manager of the new South Sioux City (Neb.) Gas Company, a division of the Nebraska Public Service Company.

Home Service Activities

Home Economists Hear of A. G. A. Tests

MISS JESSIE MCQUEEN, home service counsellor of the American Gas Association, attended the annual convention of the American Home Economics Association held in Denver, June 23-28.

About 1,500 home economists, including educators, extension workers, and women in business, were in attendance. In one of the section meetings, Miss Lita Bane, editor of the *Ladies Home Journal,* and a past president of the association, presented a paper on "Buying by Standards." In the discussion which followed, Miss McQueen was asked to describe the approval requirements of the A.G.A. Testing Laboratory, which she did as follows:

"The American Gas Association, in its testing laboratory at Cleveland, has set up certain standards which all appliances submitted for test must meet before approval. The requirements assure safety first of all, and secondly, a reasonable degree of durability inseparable from safety, thirdly, a reasonable operating efficiency.

"Using the gas range as an example, you may be interested to know that there are 159 separate tests made, 127 of which are for the purpose of determining the nature of the appliance's construction, while the remaining thirty-two are made for the purpose of determining performance requirements."

As a specific instance, requirements of construction and performance for the oven thermostat were read by Miss McQueen.

Continuing, she said:

"Each year inspections are made of every approved model by a representative of the Laboratory, either in the manufacturer's factory or in the field, to insure maintenance of type of construction and quality of performance possessed when the appliance was submitted for test. Approvals subsequent to those from tests are contingent on satisfactory reports of inspection. The approval activities are, therefore, more than mere inspection of one model and approval forever after of models bearing the same name and number. They include a thorough test of each model and a periodical check up.

"The American Gas Association Laboratory uses as a guide in conducting its various tests, requirements which are drawn up by committees consisting of representatives from the United States Bureau of Standards, United States Bureau of Mines, United States Public Health Service, National Association of Heating and Piping Contractors, Master Plumbers Association, the Canadian Gas Association and the gas company and manufacturer members of the American Gas Association. These committees in fact represent practically every interested national element including important trade associations.

"Another member of the Approval Requirements Committee recently appointed, is a representative of the American Home Economics Association, at the suggestion of the American Standards Association.

"We have considered possible questions arising in the mind of an analytical person regarding these requirements, as to how safe and practical is this approved appliance test, what tests are made, does other gas equipment meet similar tests, how authentic are the standards and then the last question—how do we know when such an appliance meets these requirements?

"An approved gas appliance is easily identified by the Laboratory Approval Seal, a five-pointed blue star, and the encircling statement 'Complies with National Safety Requirements.'

"Manufacturers do not have to submit their appliances to the Laboratory in order to put appliances on the market. There are some who have not yet chosen to do so. Some manufacturers do not submit all their appliances. This number is small in proportion to the large percentage of manufacturers who do desire to have the 'Seal of Approval' on their equipment.

"The A.G.A. Laboratory was founded in 1925 to insure the user, and the public in general, safe gas appliances, assist the appliance manufacturers in producing safe and efficient equipment, improve the art of appliance design, and eliminate forever from the market, at the earliest possible moment, appliances that do not meet the proper concepts of substantiality, utility, and above all things, safety."

Gasettes

Miss Margaret Ingels, who is one of the few women graduate mechanical engineers of the country, is doing educational work for the Carrier Lyle Corporation at Newark, N. J. A letter has recently been sent out from this house-heating company to all home service directors describing a lecture service on the above subject to explain the use of gas as the ideal fuel medium for air conditioning the modern home. Gas is used exclusively in the Carrier Weather Making System of air conditioning for residences. Home service directors will read with interest Miss Ingels' story on "Modern Weathermaking," which appears elsewhere in this issue.

Many gas companies and manufacturers are making use of the article in the May issue of *Good Housekeeping* entitled "Gas Ranges Improved and Approved." A supply of the reprints can be had from Good Housekeeping Institute.

"Home making in Switzerland" was the theme of an afternoon's entertainment given by the Home Service Department of the Milwaukee Gas Light Company for the members of the Home Economics Club of Milwaukee. Mrs. Ella Liner Lambert, director of the department, told the guests something of the food habits and customs of the Swiss and also showed them how to prepare some typical Swiss foods. Further insight into the home life of the native Swiss was given by Mrs. R. E. Stoll whose home was formerly in that Alpine nation.

Instead of importing a cooking school demonstrator to preside over their annual 1930 cooking school held in the city's largest auditorium, the Worcester, Massachusetts, *Evening Post* this year contracted with the Home Service Department of the Worcester Gas Light Company of which Mrs. Lyda E. Flanders is the director. It was a three-day school and concluded with an evening session at which not only was standing room at a premium but it was estimated that 3000 were turned away because of lack of space. Each session was opened by a leader of a representative women's club such as the president of the Worcester Women's Club, the president of the Quota Club and the president of the Worcester County Extension Service, all paying tribute to the worthwhile work of the home service department.

Course at Cornell

A group of students of the New York State College of Home Economics became so interested in the possibilities of home economics in the commercial field that this year an educational course was given to familiarize them with the organization and operation of a Home Service Department. Consequently the aid of the Empire State Gas and Electric Association was solicited and the women's section of that organization planned a group of lectures and obtained the lecturers from various utility companies near Ithaca. Among others these included Miss Jessie B. Lane of the New York Power and Light Corp., Schenectady, N. Y., who is in charge of the educational group of the women's section of the Empire State Association.

A field trip taken by the class included a trip to the Binghamton Gas Company at Binghamton, N. Y. Through an arrangement with Miss Myra Jane Robinson, Assistant Professor of Home Economics at Cornell, the entire Home Service class of 24 girls chartered a bus and drove to Binghamton, a distance of over 100 miles. A lecture demonstration was given to them by Mrs. Luella M. Fisher, Home Service Director of the Erie Stove & Manufacturing Company.

Testing Laboratory
R. M. CONNER, Director
MANAGING COMMITTEE
R. W. GALLAGHER, Chairman N. T. SELLMAN, Secretary

Investigation of Bottled Gases at Laboratory

WITHIN the last three or four years, a new branch of the gas industry, interested in the manufacture and distribution of "bottled gas," has come into existence. Its rapid and steady growth has resulted in an ever-increasing demand for appliances, particularly gas ranges, suited to the use of such gases. This demand now totals several thousand ranges per month.

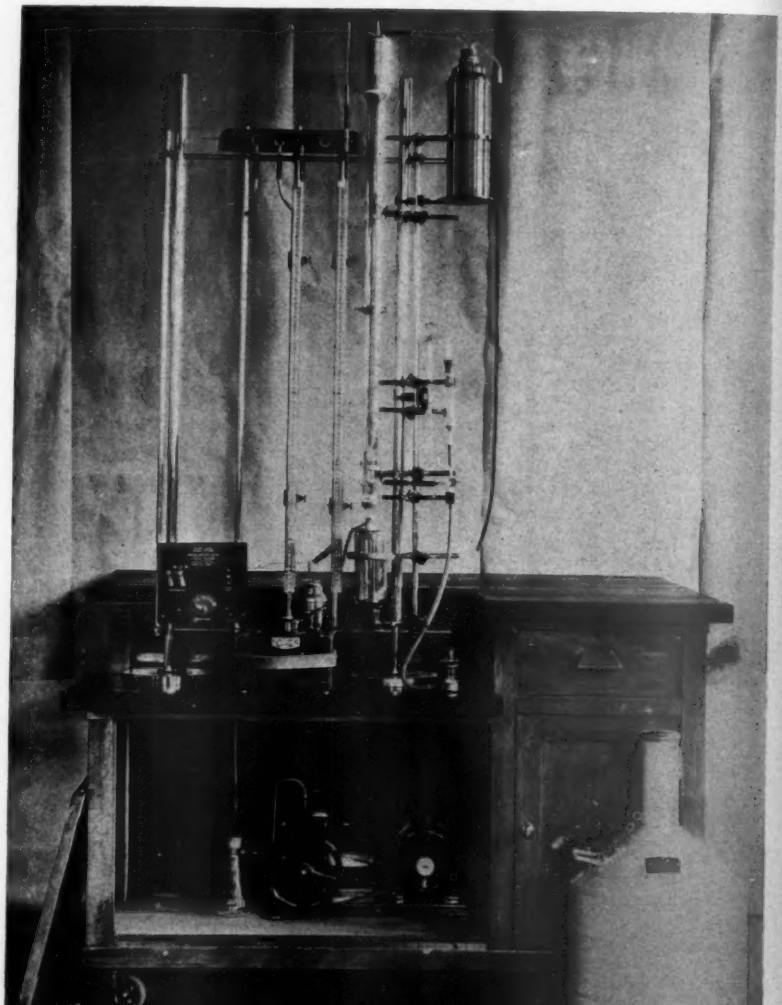
The Association's Laboratory approves gas ranges to utilize city gases, ranging in heating value from 400 to 1200 B.t.u./cu.ft., with specific gravities varying from 0.37 to 0.7. Approved appliances cannot, therefore, be used satisfactorily on "bottled gas," which is generally composed of propane and has a heating value of approximately 2500 B.t.u./cu.ft. with a specific gravity of about 1.5. Consequently it became necessary to adopt a special type of construction for "bottled gas" ranges, which, under the present requirements, could not be tested and approved by the A. G. A. Laboratory.

The result of this situation has been that some of the manufacturers of "bottled gases" requested the Laboratory Managing Committee to authorize an investigation for the purpose of seeing what could be done in the way of approving appliances for the consumption of such gases. This request was acted upon and for the past few months research work has been going forward which has for its aim the establishment of "A. G. A. Approval Requirements for Bottled Gas Ranges," and consequently a program for testing and approving equipment of this kind.

The work has proceeded along four main lines:

1. A study of the performance of bottled gas ranges now on the market.
2. Observation of the performance of the ordinary gas range designed for city gas when utilizing bottled gases.
3. A study of the characteristics of regulators used with bottled gas installations.
4. Analysis of various bottled gases now on the market for chemical composition.

The first two phases of the work involved the customary tests for completeness of combustion, top burner efficiency, oven heating capacity, burner operating characteristics, etc. It was interesting to note that, although the top burner rates on bottled gas ranges are much lower than customary on regular ranges, the performance obtained on gas ranges properly constructed for bottled gases was quite satisfactory.



Instrument for Analysis of gas by Fractional Distillation

The third study involved the possibility of maintaining a constant line pressure of about 10 in. H_2O while the gas pressure in the cylinder varied from 10 to 150 lbs. per sq.in. This pressure change would be caused by a temperature increase from 20° below zero to 90° above. The upper pressures were obtained by surrounding the cylinder with water at the proper temperature. The 10-lb. pressure, however, could only be obtained by packing the cylinder in dry ice.

The fourth problem, gas analysis, brought into use the Laboratory's recently acquired instrument for analysis of gas by fractional distillation. This unique piece

of equipment is shown by the accompanying photograph. The instrument is particularly adapted to the analysis of liquefied gases, and since the equipment has been modified to suit the Laboratory's requirements, it lends itself readily to the analysis of bottled gas, which usually consists of approximately 3 per cent ethane, 96 per cent propane, and 1 per cent butane.

Briefly, the operation is as follows: the gas sample is introduced into the completely evacuated apparatus and liquefied by means of liquid air; the liquid sample then boils at a controlled pressure and temperature in such a manner that the various fractions come off in a pure vapor from the column and pass into a receiver. The temperature of the vapor coming over is obtained. This identifies the gas. The amount of vapor in the receiver is measured by the pressure shown on a mercury column. Pressure and temperature readings are taken simultaneously during the analysis. The temperatures are then plotted against the pressures on a chart from which the composition of the gas can readily be calculated.

As a result of the extensive research briefly outlined above, conducted for the A. G. A. Approval Requirements Committee for Gas Ranges, it is hoped that this group will be in a position to propose approval requirements for bottled gas ranges in the near future.

Committee Activities

MEETINGS of six approval requirements committees were held during the month of June. The purpose of four of these committee meetings was to consider revisions to the existing requirements, while two of the meetings were held by committees preparing A. G. A. Approval Requirements for additional types of appliances which heretofore have not been tested for approval. Included in the former were meetings of the subcommittees on incinerators, gas ranges and central heating appliances, as well as a meeting of the A. G. A. Approval Requirements Committee. In the latter group on new requirements were the subcommittees on gas-heated ironers and on the installation of conversion burners.

In addition to the above, a meeting of the Mixed Gas Research Committee and a meeting of the Laboratory Managing Committee were held at the Testing Laboratory during June.

Approval for New Appliances

A. G. A. Installation Requirements for Conversion Burners are now being prepared by a special subcommittee which was appointed for this work and it is expected that these requirements will be completed and go into final effect early next year.

A tentative set of Approval Requirements for gas-heated ironers has recently been completed and have been submitted to the industry for criticism, and they will go into effect about February 1, 1931.

At a recent meeting of the A. G. A. Approval Requirements Committee, the appointment of subcommittees to draft A. G. A. approval requirements for the following types of appliances was authorized:

1. Gas-Fired Refrigerators
2. Hotel and Restaurant Ranges
3. Garage Heaters
4. High-Pressure Gas Boilers

Steps are now being taken to secure the services of competent gas company members and appliance manufacturer members who are directly interested in the respective types of appliances to serve on these committees. It is expected that all preliminary arrangements will have been made and that these committees will begin functioning during the next few months.

Church Suppers

WILLIAM E. FOSTER
Church Architect

IT is written, that at the installation of George Neville (1464-1476) at York Minster, in England, a feast was provided to regale the assembled throng. The feast is famous in the annals of gastronomy. The list of provisions, including among other things 330 tuns of beer, 104 tuns of wine, eighty fat oxen, 1004 sheep, 3,000 geese, 100 peafowls, 4,000 woodcocks, eight seals and four porpoises, will be found in Godwin's "De Praesulibus Angliae." The meeting must have been well attended. No mention is made of the manner in which the food was cooked and served, so we will have to rely upon our imaginations for these details. It is safe to say, however, that the methods of preparing food used in the household kitchens of that time had to be greatly modified and expanded.

We no longer indulge in church dinners of such magnificent proportions, but we do have frequent dinners at which several hundred people are fed quickly and served daintily. The success of these fellowship dinners is vital to the work of the church and it can hardly be denied that the quality and temperature of the food, especially the coffee, which in our time has supplemented beer and wine at such gatherings, has considerable bearing upon the attendance and upon the receptive mood of the people. Any after-dinner speaker can attest to the truth of this statement.

To serve properly even 100 people is a task of no mean proportion. From time immemorial this task has fallen to the ladies, so they are naturally more interested in the kitchens and kitchen equipment than the men, who are generally anxious to avoid any work or responsibility in the matter. In many churches women are not only expected to do the work connected with church meals, but are also expected to pay for the equipment. In a recent large church building, designed by the writer, the ladies pledged themselves to pay for several thousand dollars' worth of equipment, which they promptly proceeded to do by a series of successful family night suppers. Does not this seem like driving a free horse to death? Would not the church as a whole benefit if the kitchen equipment was paid for out of the general building fund? Should not the men provide equipment that will as far as possible lighten the work of the ladies?

There is an unfortunate impression that the church kitchen is an enlarged home kitchen and that experience gained in the latter fits a woman, without the necessity for further training, for work in the former. This is only true in the case of very small church kitchens. The large church kitchen has a problem similar to that of a restaurant, which is really a problem of manufacturing and selling food of good quality at low cost. The kitchen in a hotel or restaurant is planned with the utmost care in order to save labor, to reduce the amount of help required, both for the preparation and serving of the food and to improve the quality of the food. The idea is to cut down cost and to improve quality. Much special equipment has been designed for this purpose, most of which is entirely unknown to the home kitchen.

No experienced restaurant owner would think of planning a new kitchen layout without consulting experts on the subject. It is far more important that the church building committee should avail themselves of such advice, for to them large scale food preparation is at best a poorly understudied subject. Fortunately, most of the manufacturers of restaurant equipment will gladly study kitchen problems and make suggestions as to equipment and arrangement and will instruct ladies in the use of the kitchen when completed.

Domestic Gas Appliance Course

THE Testing Laboratory of the American Gas Association, at Cleveland, Ohio, during the week of June 16 was headquarters of an intensive training course in the design, operation, and servicing of domestic gas appliances. This educational work was started last year, at the instigation of the National Home Service Committee, of the American Gas Association which desired that home service workers be given the opportunity to better acquaint themselves with appliance operation. Invitations were also extended to men working in various phases of the gas industry. The success of the course of 1929 warranted its repetition in 1930.

The entire week was devoted to lectures and demonstrations of appliance operation; social functions were arranged in the evening, including a banquet and a sight-seeing trip through the business and residential districts of Cleveland.

Included among the forty men and women who registered were seventeen home service workers and directors, seventeen service men, three gas engineers, two college teachers—Miss Daisy Davis, of Ohio State University, and Miss Cora E. Swingle, of Texas State College for Women—and one public health official, Dr. Wilmer H. Schulze, of the Baltimore Health Department. Dr. Schulze is chief of the Division of Chemical Technology and directly in charge of enforcing the ordinance which limits the sale and installation of gas appliances in Baltimore to those which have been tested and approved for safety and operation.

Opening remarks as the course began were made by R. W. Gallagher, president of The East Ohio Gas Company, who briefly summed up the accomplishments and potentialities of various branches of the gas industry. Lectures on appliances by Laboratory engineers were interspersed during the entire week with talks of general interest given by prominent gas men and women.

G. E. Whitwell, vice-president of the Equitable Gas Company, Pittsburgh, Pa., speaking on "Sales and Service," said—"Before we can use gas, we must use gas equipment—that company is most efficient in which every employee considers himself a salesman, and who stresses the benefits received from the proper use of gas in satisfactory appliances. Home service is not necessarily a direct selling agency. Its biggest field is to create the desire for better and more convenient gas service and gas appliances."

E. D. Milener, industrial gas research representative of the American Gas Association, addressed the class on "Some Recent Developments in Wholesale Bread Baking." The history and developments of the modern traveling oven were aptly illustrated with slides which showed the most recent installations. Attention was called to a report of the research work done by the Research Committee in cooperation with the American Institute of Baking entitled "The Application of Heat to Bread Baking."

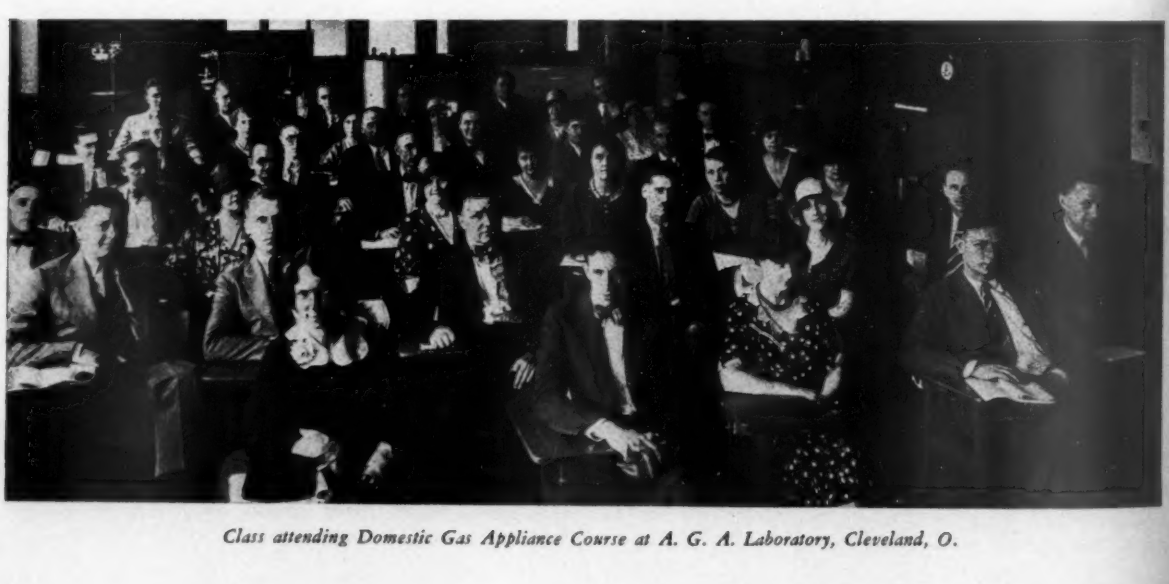
Business was combined with pleasure when the group had luncheon at the "Home in the Sky," and listened to a short talk by Mrs. Florence LaGanke Harris, director. The "Home in the Sky," constructed on the seventeenth and eighteenth floors of the Builders' Exchange Building, Cleveland, Ohio, is a brick house, completely furnished from bedroom to garage with modern furnishings and appliances.

Addresses given by women prominent in home service work included: "The Use of Portable Gas," by Miss E. E. Hinkley; "Modern Baking Practice," by Miss Dorothy Shank; "Home Service Organization," by Miss Ada Bessie Swann; "Customer Contacts," by Miss Ruth Soule; "Home Service Progress," by Miss Jessie McQueen.

The lectures on the types, design, operation, installation and servicing of all the commonly used appliances were given by members of the Laboratory staff, with the exception of a talk on "Central Heating Appliances and Controls," given by G. B. Shawn, chief engineer of the B-Line Boiler Company.

Some of the more important points stressed on ranges were as follows: Insulated versus non-insulated ovens, and an explanation of the setting and adjustment of gas range thermostats; the various types of water heaters and their accessories; selection of type and size, installation, and servicing also received considerable attention; the proper design and operation of radiant heaters, radiators and circulating heaters; refrigerators, incinerators and clothes dryers. New appliances, which are rapidly gaining in importance, produced a great deal of interesting discussion.

R. M. Conner, director of the Laboratory, addressed the group on "The Home Service Workers Place in The Gas Industry." Dr. F. E. Vandaveer, Laboratory supervisor, gave a general comprehensive talk on the effect of the change of pressure, specific gravity, heating value, or chemical composition of the gas supply on appliance operation, illustrating some of the effects of such changes with a number of lantern slides.



Class attending Domestic Gas Appliance Course at A. G. A. Laboratory, Cleveland, O.

John Corsiglia, Laboratory chief engineer, gave an address on chimney conditions, the effect of up and down drafts, and the use of draft diverters as a means of isolating the appliance from abnormal chimney conditions.

At the close of the course, those attending expressed their general satisfaction in the manner in which the various subjects had been presented and were quite enthusiastic about seeing it continued next year so that those who had not had the opportunity to attend could do so in 1931.

In view of the interest and enthusiasm displayed by those in attendance this year a similar course probably will be given in 1931.

Those who attended the course were as follows:

Anderson, Leah L., Ruud Manufacturing Company, Pittsburgh, Pa.

Brigham, Harriet C., Buffalo, N. Y.

Clock, Dorothy C., Kansas City Gas Company, Kansas City, Mo.

Cotharin, Mrs. Florence, Detroit City Gas Company, Detroit, Mich.

Courtney, D. G., Godfrey L. Cabot, Inc., Oak Hill, W. Va.

Davis, Daisy, Ohio State University, Columbus, Ohio.

Evans, Mary Barbara, Scranton Spring Brook Water Service Co., Scranton, Pa.

Fetzer, J. R., East Ohio Gas Company, Wooster, Ohio.

Harig, Edmund, East Ohio Gas Company, Massillon, Ohio.

Heavilon, Mary J., Frankfort, Indiana.

Hickey, Irene, Detroit City Gas Co., Detroit, Mich.

Hulser, Marie, American Gas Association, New York, N. Y.

Kaiser, C. H., East Ohio Gas Company, Barberton, Ohio.

Lahr, Harry, East Ohio Gas Company, Massillon, Ohio.

Lake, Edith R., East Ohio Gas Company, Cleveland, Ohio.

Lockhart, Robert E., East Ohio Gas Company, Cleveland, Ohio.

Lotter, Wm., Reliable Stove Company, Cleveland, Ohio.

Mackowski, Virginia, New York State Electric & Gas Corp., Lockport, N. Y.

McKenna, B. J., East Ohio Gas Co., Warren, Ohio.

McManus, Anne V., East Ohio Gas Co., Youngstown, Ohio.

McNamee, F. O., East Ohio Gas Co., Ravenna, Ohio.

McQueen, Jessie, American Gas Ass'n, New York, N. Y.

McVay, Jos. A., East Ohio Gas Co., Dover, Ohio.

Meister, Frank J., East Ohio Gas Co., New Philadelphia, Ohio.

Miller, Ernest B., East Ohio Gas Co., Kent, Ohio.

Oeffinger, Emil, Jr., East Ohio Gas Co., Canton, Ohio.

Reichman, C. O., East Ohio Gas Co., Dennison, Ohio.

Rowe, Ina B., New York City.

Russell, Bessie Bell, Middle West Utilities, Chicago, Ill.

Sawyer, H. J., East Ohio Gas Co., Warren, Ohio.

Schulze, Wilmer H., Baltimore Health Department, Baltimore, Md.

Simmons, Mrs. Beth Mason, Northwestern Ohio Natural Gas Co., Toledo, Ohio.

Soule, Ruth, The Brooklyn Union Gas Co., Brooklyn, N. Y.

Strong, C. E., East Ohio Gas Co., Wadsworth, Ohio.

Swingle, Cora E., Texas State College for Women, Denton, Texas.

Vagg, Melva, N. Y. State Electric & Gas Corp., Lockport, N. Y.

I. H. Weinberg, Pittsburgh, Pa.

Yost, H. B., Hope Natural Gas Co., Clarksburg, W. Va.

Young, Robert P., East Ohio Gas Co., Akron, Ohio.

Visitors

Dowler, Flora, Columbus Gas & Fuel Co., Columbus, Ohio.

Fisher, Luella M., Eriez Stove & Mfg. Co., Erie, Penn.

Steffen, E. G., Milwaukee Gas Specialty Co., Milwaukee, Wis.

Ungericht, Hulda, Columbus Gas & Fuel Co., Columbus, Ohio.

An Invitation To Home Service Directors

CONTRIBUTIONS in the nature of suggestions and actual copy for the new mat service, from Home Service Directors, will be welcomed by the Household Information Service of the American Gas Association, according to Marie Hulser, who issued this invitation to the Home Service group attending the course in Domestic Gas and Gas Appliances, at Cleveland.

This invitation is general. Suggestions and articles of interest about gas and gas appliances will be welcomed by the Household Information Service, and where the articles are used the "by line" of the author will be carried. The copy will be subject to editing, where necessary.

The aim of the Service is to disseminate impartial information, as already explained in a previous issue of the A. G. A. MONTHLY, about gas and gas appliances to the many homemakers of the country who can be reached through editorial columns of newspapers and household magazines of national circulation.

The articles which the Information Service is preparing will preach the efficiency of gas, its economy, its cleanliness, and what is important to the modern homemaker, its ability to assist in banishing drudgery. They will tell of the modern beauty of the gas appliance and of its accomplishments. The subject matter will be timely, the illustrations and copy prepared with the woman's page in mind. There is to be as varying a list of subjects as possible. For example, each month the mat page will carry at least one cooking article, the remainder on such subjects as hot water heating, incineration, house heating, refrigeration, washing, ironing, etc.

With the two foregoing paragraphs as a writer's guide, the Household Information Service will expect articles of from 250 to 500 words in length from Home Service Directors who would like to express themselves on their favorite gas subjects.

Further information may be obtained from Miss Marie Hulser, Editor of Household Information, American Gas Association, 420 Lexington Avenue, New York, N. Y.

Five-Year Legal Fight Ends

THOUGH holding that the advertising of the Gray & Dudley Co., of Nashville, Tenn., was unfair to the Estate Stove Co., of Hamilton, O., the Circuit Court of Appeals for the Sixth District, Cincinnati, O., ruled largely for the former, in deciding a suit which has been in various courts since 1926.

The case involved the right of the Estate Stove Company to claim for its exclusive use a stove made in the form of a phonograph cabinet, as its Heatrola is.

"Any manufacturer is primarily free to case his product in the form of some other household article," said the court. "Such an imitation or adaptation may be very appealing and lead to a large demand; but where no mechanical invention is involved, the law provides no means for giving monopoly to the one who first gets the idea, except as such means may be found in a design patent.

"The first user can acquire quasi exclusive rights only by use long enough and exclusive enough to give the word a secondary meaning, so that to that part of the public especially affected, the word or the form indicates the origin of the article."

The court said that the defendant transgressed the limits of fair competition by advertising, "No, this is not a victrola," the slogan of the Estate Stove Company being, "No, this is not a phonograph."

"However," continued the decision, "we think it clear that it would be impossible to trace to this single element of forbidden unfair competition any distinct damage. Plaintiff therefore is not entitled to an accounting for this too closely imitated advertising."

Commercial Section

G. E. WHITWELL, Chairman J. W. WEST, Jr., Secretary E. R. ACKER, Vice-Chairman

Aids in Merchandising*

By GEORGE E. WHITWELL
Equitable Gas Co., Pittsburgh, Pa.

IN selling gas, we are selling to an individual the ability to do whatever that individual wants to do with gas, whenever she wants to use it, and in the manner she wants to do it, at an overall cost that that individual thinks is fair for that service. You are successful only when you sell to the public what they want and not what you want to get over. Sales cannot exist unless somebody wants to have what we want to sell.

We are selling that much—used word—service. Our customers are not particularly interested in rates, pressure, etc., instead they are interested only in the bill at the end of the month and they accept the bill only if they think it covers what they wanted to do with our product.

All families have three necessities: shelter, food, and clothing. The only way for the gas company to get its share of the customer's dollar is to make the customer want to spend money for gas rather than something else, and that customer will not do it only if she is convinced that she will get more of health or labor-saving help out of gas and gas appliances than she will for something else.

Before we can use gas, we must use gas equipment. The telephone company is to be envied—when a customer desires telephone service, the equipment is furnished—equipment that is up to standard, that operates well and best uses the service. The gas company has no control and little influence over anything except the installation of the meter.

Therefore, we need not only to create a desire for appliances but we must try to assure good piping and installation in order to get the most efficient use of gas and gas equipment. The function of the gas company is to so conduct merchandising that there comes a realization in the mind of the customer of complete satisfaction from the product she is using. The automobile dealer has to depend on tire companies to create service on cars. The gas industry is not alone in that situation and we in the industry must get over petty matters and consider just two factors—competition of other companies and the complete satisfaction of the customer depending on correct control of gas service and satisfactory equipment.

Our selling efforts should be conducted in such a way that it brings to the company the largest return from the least expenditures of money. A few tools we have to use in merchandising are:

1. That company is most efficient in which every employee in that company considers himself a salesman for that company and can talk up the benefits of the proper use of gas in satisfactory appliances. There are 10,500 employees in the company in Pittsburgh. One meter reader in 30 days sold 680 percolators; he read the meters on time and there were no mistakes. Eight hundred employees sold percolators. This made them all sales-minded and it also put extra money at their disposal.

2. Merchandising activity in a utility company should be conducted in such a way that equipment sold to the public gives real value to the dollar and adequate equipment for the customer's use. Effort should be made to create just as many retail outlets as possible.

3. To meet competition is the part of every employee when he realizes that his job in the company depends on his effort to sell the product or give out accurate information.

4. Advertising is important in the selling of gas.

5. Satisfactory rates, too, are important.

6. Home service holds one of the most important places in merchandising. Home service in one combination gas and electric company costs $75,000 a year. It is not possible to place your finger on its tangible results. Home service is not that sort of a service. Most companies are getting over the idea that home service must be made tangible as to results. Many companies feel that they would rather dispense with any other activity in the selling game rather than give up their home service work.

Home service is not desired for direct selling. Its biggest idea is to kindle the desire of happiness, etc., that gas service will bring. Women are the purchasing factor in practically every home. No one can bring up in her mind the desire for new equipment, better than another woman.

Another feature of home service is to meet new comers. No one in town knows of new comers sooner than the utility company and some needed service to that person will create good will between that customer and the utility company.

Home service is the best agent to handle the biggest amount of complaints—a knocker converted is the best booster for a company. A woman can more easily than a man, gain access to a home, to settle complaints.

Lecture work, while essential, is necessary only as ballyhoo at a circus is needed. Lectures start thought toward new service and new equipment. Home call work in the home should come first.

Home service assists the customer in getting a higher grade of service from what equipment she already owns, because she has a more intelligent use of it. Home service sells a desire for more equipment to extend this service.

All we are trying to do is to get people to want to buy in order to accomplish what they want, when they want it, and to have them satisfied with the bill they get for it. In gaining this objective, we are in competition with everything being sold to see who will get the greatest share of the customer's dollar.

We need to make every employee a salesman and we need satisfactory equipment. This latter has been accomplished due to the work of the Laboratory under Mr. Conner's direction and the work of his able staff. We cannot use our product—an adequate supply of gas—unless we have proper equipment.

Home service is the service in the home in any way to be of effective help to that housewife. A home service worker must have the will to do, to overcome obstacles, get out and go after them in an understanding, sympathetic manner.

*Abstract of address given in Cleveland, O., at A. G. A. Testing Laboratory Domestic Appliance Course, June 19, 1930.

Gas Users' Deposits Held Taxable Loans

THE Pennsylvania Supreme Court at Harrisburg recently ruled that deposits put up with gas companies by patrons who are non-property owners are loans and as such are subject to the State loans tax.

The ruling was handed down in the case of the State against the Peoples Natural Gas Company of Pittsburgh, which holds $250,000 in such deposits, most of it in amounts of $5 each.

Industrial Gas Section

C. C. KRAUSSE, Chairman — C. W. BERGHORN, Secretary — D. W. CHAPMAN, Vice-Chairman

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GENERAL DATA—A

Comparisons—A-IV

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(Carburizing and heat treating.)

Furnace Design—A-V

Heat Treating & Forging... New type of pair heating furnace ..... May 1930, p. 648

Heat Treating & Forging... High- and low-pressure air for furnaces ..... June 1930, p. 778
(Comparison of cost of air from blower and from compressor when employed in burners as a protecting curtain.)

Cutting—A-XI

Engineering News Record. Practices in flame-cutting of steel reported harmful... Apr. 24, 1930, p. 684
(Brittleness of brackets flame cut after punching.)

Water Heating—A-XII

American Gas Journal ..... Gas makes America's national drink ..... June 1930, p. 45
(Washing bottles.)

Miscellaneous—A-XIV

Gas Age-Record ..... The gas engine becomes economical ..... May 17, 1930, p. 717

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HEAT TREATMENT OF FERROUS METALS—B

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Heat Treating & Forging... Nitriding of steel in European practice ..... Jan. 1930, p. 49
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Heat Treating & Forging... Case hardening with nitrogen ..... Apr. 1930, p. 502
(A non-technical review of the process.)

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(Recent mechanical and metallurgical improvements.)

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Trans. American Soc. for Steel Treating .... The economics of heat treating ..... May 1930, p. 615
(Fuel for heat treating not a problem of B.t.u. costs but an economic problem involving a study of overall costs. Some situations are analyzed.)

METAL MELTING—D

Stereotype, Linotype and Monotype—D-II

Gas Age-Record ..... Developments in stereotype melting ..... May 10, 1930, p. 683
(Results with new gas-fired immersion type burners, and with blast burners.)

Galvanizing—D-III

Heat Treating & Forging... Hot galvanizing as it affects mild steel ..... Jan. 1930, p. 70
(Effect on physical properties of cold worked steel with particular reference to bolt steel grades.)

Heat Treating & Forging... The smoothness of zinc coatings ..... June 1930, p. 729
(Factors involved enumerated and explained.)

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(Study of zinc-iron alloys—influence of temperature.)

Iron Age..... Critical temperature in galvanizing ..... Mar. 27, 1930, p. 933
(At about 950° F. several changes occur. Less action at 1000° than at 950°.)

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Miscellaneous—D-XII

Iron Age..... Open hearth operators discuss their steel-making problems ..... May 29, 1930, p. 1601
(Consumption of natural gas in open hearth furnaces.)

INDUSTRIAL STEAM APPLICATIONS—E

Industrial Gas.. Textile printing ..... June 1930, p. 7
(An automatic steam boiler application.)

Western Gas... Natural gas in a sugar refinery ..... May 1930, p. 71
(Gas fuel for bone black kilns and steam boilers.)

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(Efficiency test results.)

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Miscellaneous—F-IV

Bakers Weekly. Bakery oven fuels ..... May 3, 1930, p. 59
(Rough fuel cost comparisons made by the use of average figures for oven efficiencies.)

FOOD PRODUCTS—G

Coffee—G-V

Food Industries. Continuous coffee roasting. May 1930, p. 200
(Completely automatic handling and control with continuous gas-fired roasters.)

Miscellaneous—G-VI

American Gas Journal ..... Natural gas handles a "hot" assignment ..... June 1930, p. 43
(Drying peppers to make chili powder.)

Manufacturers Section

F. G. CURFMAN, Chairman — C. W. BERGHORN, Secretary — E. S. DICKEY, Vice-Chairman

Canadian Tariff Rulings on Machinery

THE following Canadian Customs Memorandum No. 321, dated May 30, 1930, reported by telegram of June 9, from American Commercial Attache Lynn W. Meekins, at Ottawa, deals with the classification of machinery, engines or boilers, electrical apparatus, and manufactures of iron or steel under the special classifications at reduced rates applicable when the articles are of a class or kind not made in Canada:

"Re-tariff items 427, 428b, 445j, and 446, in effect May 2, 1930: Unless the imported goods have been ruled by the department as being of a class or kind not made in Canada, entries thereof are not to be accepted under the above mentioned tariff items, but the goods are to be rated under tariff items 427a, 428c, 445k, and 446a, as the case may be.

In cases where the importer contests such tariff classifications, descriptive illustrations and full particulars, including specifications, where necessary, and also the importer's evidence, if any, of efforts made to obtain goods of Canadian manufacture of the same class, are to be forwarded to the Department of National Revenue for investigation and ruling.

It is ruled by the Department that the tariff items mentioned above are not applicable to goods which are provided for specifically or otherwise in other tariff items.

Entries of goods cleared under tariff items 427a, 428c, 445k, and 446a will be subject to adjustment by refund claims, if warranted, after departmental rulings are made."

Tariff No.		*General Ad val.*	*Preferential Ad val.*
427	All machinery composed wholly or in part of iron or steel, of a class or kind *not made in Canada,* n.o.s.,* and complete parts thereof	20%	Free
427a	All machinery composed wholly or in part of iron or steel, n.o.s., and complete parts thereof	30%	15%
428b	Engines or boilers, of a class or kind *not made in Canada,* and complete parts thereof, n.o.s.	20%	Free
428c	Engines or boilers, and complete parts thereof, n.o.s.	30%	15%
445j	Electric apparatus of a class or kind *not made in Canada,* n.o.s., and complete parts thereof	20%	Free
445k	Electric apparatus, n.o.s., and complete parts thereof	30%	15%
446	Manufactures, articles or wares, of iron or steel, or of which iron or steel, or both, are the component materials of chief value, of a class or kind *not made in Canada,* n.o.s.	20%	Free
446a	Manufactures, articles or wares, of iron or steel or of which iron or steel or both are the component materials of chief value, n.o.s.	30%	15%

*"n.o.s." means "not otherwise specified in the tariff." The general rates apply to imports from the United States; the preferential rates, to imports from British countries.

Report on Application of Heat to Bread Baking Available

COPIES are now available at American Gas Association Headquarters of "The Application of Heat to Bread Baking," which is a report covering one of the most important researches sponsored by the Committee on Industrial Gas Research. This report which covers two and one-half years' work at the American Institute of Baking gives results and conclusions which are of interest and value not only to gas men and oven builders, but to bakers as well. The results briefly are as follows:

Results

1. The quality of bread with respect to its flavor is not affected by the kind of atmosphere in which the bread is baked.

2. The amount of shrinkage (all other conditions remaining the same) is a function of the degree to which bread is baked.

3. The bread baked simultaneously from the same batch of dough and to the same degree will have the same shrinkage loss whether baked in a low-temperature radiation oven or a convected heat oven.

4. The bread baked in a high-temperature radiation oven shows greater shrinkage due to thicker crust formation.

Conclusions

1. The best method of heat application for bread baking can be achieved through either low-temperature radiation or convection, or a combination of the two.

2. Gas can be applied equally as well through low-temperature radiation, convection, or a combination of the two.

3. The choice rests largely on the economics and engineering of oven design combined with the economics of the available fuels.

The book gives a complete review of recent developments in wholesale bread baking, organization of research and a complete digest of hundreds of test runs. It is of particular value to gas companies for distribution to bakeries in their territories, both those now using gas for heating ovens as well as those prospects that the gas companies are attempting to secure.

Results and conclusions are signed by Dr. C. B. Morison, Director of Scientific Research of the American Institute of Baking, and E. G. de Coriolis, Research Director of the Surface Combustion Company.

The cost of the book is 30 cents a copy, and 25 cents a copy when more than ten are ordered. Orders should be sent to American Gas Association, 420 Lexington Avenue, New York City.

List of Exhibitors Still Growing

SINCE the last published list of exhibitors, the following companies have been allotted space at the Twelfth Annual Convention of the American Gas Association:

Amherst-Logan County Coal Corporation	107
Econoheet Company	745
Favorite Stove & Range Company	843
Intercolonial Gas Journal	810
Everhot Heater Company	814
Ryan, Scully & Company	721
Skinner Company, M. B.	128
Thatcher Co., The	840
Pittsburgh Incinerator Company	811
U. S. Bureau of Mines	2
Vulcan Manufacturing Company	816
Mettler Company, Lee B.	821—22

Publicity and Advertising Section

JAMES M. BENNETT, Chairman ALLYN B. TUNIS, Secretary DONALD M. MACKIE, Vice-Chairman

Laws Hamper Outdoor Advertising

STATE laws governing advertising on highways constitute a veritable hodgepodge, according to an investigation just concluded by the United States Bureau of Public Roads. These regulations, in most cases, appeared to have "just grown up," without any uniform basis.

The laws of four States—Connecticut, Nevada, New Mexico and Utah—require that all advertising signs be placed certain distances from public highways. Thirteen States either require that advertising agencies be licensed and collect an annual fee for each sign, or impose a tax for each sign. In most cases they require permits, to the applications for which must be attached the written consent of owners of property on which signs are to be erected. Applications, as a rule, must state the sizes of signs and proposed locations.

Connecticut levies a license fee of $100 a year, and an annual permit fee varying from $3 for each panel of 300 sq.ft. or less to $9 for those between 600 and 900 sq.ft. Vermont collects an annual fee of $25 and levies an annual tax ranging from 50 cents for each panel or separate display of 6 to 15 sq.ft. to $9.25 for 550 to 600 sq.ft., increasing the rate 75 cents for every additional 50 sq.ft.

A license fee of $10 is collected in North Carolina from agencies for signs outside incorporated towns and cities. In cities the fees are based on population and vary from $10 for less than 5,000 inhabitants to $100 for more than 35,000.

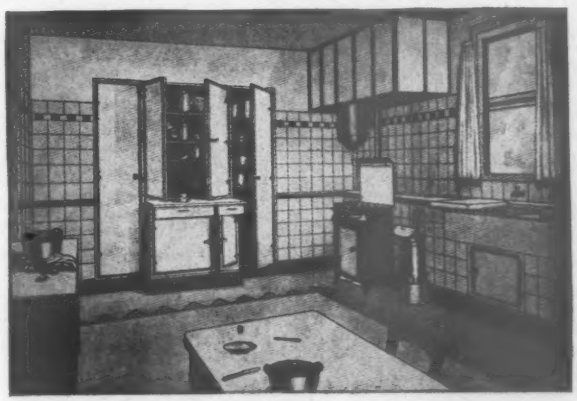
After January 1, 1931, every outdoor advertising agency in New Jersey will be required to secure an annual license from the commissioner of motor vehicles and pay an annual fee of $100, and an additional fee of three cents for each square foot of display.

Nebraska requires a State permit for advertising signs and collects a fee of 25 cents to $5 for each sign. No sign may have a surface area of more than 10 sq.ft. Similar fees are assessed by other States.

How it is Done by the Swiss

Au ménage moderne

le gaz offre tous les conforts désirables!



CUISINIÈRE AU GAZ

EAU CHAUDE AU GAZ

CHAUFFAGE AU GAZ OU AU COKE DE GAZ

B 11

THE "Société Suisse de l'Industrie du Gaz et dea Eaux," Zurich, Switzerland, has been conducting an advertising campaign looking toward the sale of gas appliances. Above is reproduced a recent piece of their copy.

Prize-Winning Window Displays

A WINDOW DISPLAY—above—of The Consolidated Gas Company of New York captured first prize in the Utility Group at the Eastern Division Display Men's Convention, held in New York during June. In addition, the International Association of Display Men, in convention at Chicago during the same month, awarded the Consolidated Company first, bottom; second, left, and third, right, prizes.

Natural Gas Department

H. C. MORRIS, Chairman — E. J. STEPHANY, Secretary — H. C. COOPER, Vice-Chairman

Obtaining Valuable Products from Natural Gas

THE treatment of natural gas by pyrolysis, or decomposition at high temperatures, for the purpose of obtaining various commercial products, recently has received considerable attention, not only in this country, but among European nations as well. A study of the matter is being made by the United States Bureau of Mines, Department of Commerce, and the State of Oklahoma at the Petroleum Experiment Station, Bartlesville, Okla.

When methane is subjected to temperatures of 1800 to 2200° F. it breaks up or "cracks." At slightly lower temperatures the parts reunite, but form new products as they combine. The higher hydrocarbon gases also break up and reunite to give various products different from the parent substances. At sufficiently high temperatures the gases will decompose to carbon and hydrogen.

In either type of cracking, hydrogen is always set free and by suitable means can be isolated and used commercially. Its major uses are as a reducing agent in the process industries, the hydrogenation of mineral and vegetable oils and coal; the synthetic production of ammonia and fertilizers; and as a refrigerant.

Other gases formed in the pyrolysis of natural gas are acetylene, butadiene, ethylene, propylene and butylene. Acetylene is used in welding and cutting metal; and may be used to prepare acetahdehyde, which is further used in silvering mirrors or in the preparation of medicinals such as chloral, a soporific. Butadiene, under proper treatment, condenses to form an artificial rubber having the same general composition as natural rubber. Ethylene has recently come into use in ripening fruits. It is also finding use as an anesthetic. However, its major use at present is the synthesis of ethylene glycol, an anti-freeze for water cooled motors, and the basis for a series of important lacquer solvents. If desired, ethylene may be converted to ethyl alcohol, widely used as a solvent, also in the preparation of other compounds such as ether. Again by the proper reaction with chlorine, ethylene chloride is formed. This is a valuable solvent, especially for fats and essential oils, and is also used as an anesthetic. Propylene finds use as an anesthetic, and also in the synthesis of Iso-propyl alcohol, which is being substituted for ethyl alcohol with good results in certain instances. Butylene is also used in the preparation of certain butyl alcohols which are finding use as solvents in the chemical industries.

The principal liquids formed in the pyrolysis of hydrocarbon gases are benzene, toluene and xylene. Benzene is a very valuable product and forms the basis of many chemical processes. Thus are obtained aniline and the entire series of aniline dyes, and many explosives, perfumes and medicinals. In addition benzene is an excellent solvent and anti-knock motor fuel. Toluene is the basis of the familiar T.N.T. (trinitritoluol), of dyes, and of saccharin, a sugar substitute 400 times as sweet as sugar. Xylene is similarly used in the synthesis of dyes and other products, and also to a large extent as a solvent.

The solids resulting from pyrolysis are chiefly naphthalene and anthracene. Naphthalent is well known as an insecticide in the form of moth balls. It is also the basis for the important indigo dyes. Anthracene is used in the synthesis of alizarin dye stuffs. Finally, under certain conditions of cracking, there is obtained carbon black, widely used in making ink, in compounding rubber, and as a pigment for paint.

Gas Light Better and Costs Less

Speaking over the Columbia Broadcasting System on June 28, B. J. Mullaney, president of the American Gas Association, among other things, said:

"Edison's electric light, perfected in 1879, told gas lighting to move on. The gas industry countered with the Welsbach incandescent gas mantle, perfected in 1890. And right now, properly mantled gas lamps give more and better light for less money than electricity does, although popular favor rules otherwise."

Copies of Mr. Mullaney's talk—"Romance of the Gas Industry"—may be had upon application to the American Gas Association, 420 Lexington Avenue, New York, N. Y.

Weymouth Chairman of Oklahoma Natural

T. R. Weymouth

ANNOUNCEMENT was made at Tulsa, Okla., July 15 of the elevation of Thomas R. Weymouth, president of the Oklahoma Natural Gas Corporation for the last two years, to the chairmanship of the board of that corporation, and of the election of E. C. Deal, formerly president of the Peoples Light & Power Corporation of New York, to the presidency of the Oklahoma Natural Gas Corporation to succeed Mr. Weymouth, who will divide his attention between the Oklahoma Natural and the American Natural Gas Corporation of which also he is president. Mr. Weymouth will continue to make his home in Tulsa.

Mr. Deal will locate in Tulsa, with his family, and devote himself actively to the executive responsibilities of the Oklahoma Natural. At different times he has been associated in an executive capacity with Electric Bond & Share Company, Public Service Company of New Jersey, Stone & Webster Corporation, Federal Light & Traction, and other important public utility organizations.

Mr. Weymouth, who is president also of the Texokan Oil Corporation and of the Gas Engineering Corporation, was president of the Oklahoma Utilities Association for the term ending in March this year. He came to Oklahoma from Buffalo, N. Y., where he had been president of the Iroquois Gas and Iroquois Building corporations.

English View of Chemist's Handbook

THE following brief review is extracted from the current issue of the *Journal of the Institution of Mechanical Engineers*, London, England.

"**Gas Chemist's Handbook 1929 (3d ed.).** 750 pp. 8vo. $7.00.

"American Gas Association, New York; from the Publishers.

"This comprehensive handbook treats of the raw materials of gas manufacture and its products—gas, ammonia, oils, tar, and cyanogen. Impurities in gas are then considered—hydrogen sulphide, ammonia and total sulphur, tar, naphthalene, carbon bisulphide and iron carbonyl. Much attention is given to gas analysis and to the testing of various materials—water, paint, lubricants, metals and solder, refractory materials, cement, lime, etc. The methods adopted are mostly those of the American Society for Testing Materials, but there are other interesting methods of analysis for light oils, purifying materials, and ammonia."

Copies of the *Gas Chemist's Handbook* are available at Headquarters of the American Gas Association, 420 Lexington Avenue, New York, N. Y.

Engineer Predicts All Fuel To Be Gas

THE time when the burning of solid fuel will be as obsolete as candle light is foreseen by Martin T. Bennett, gas engineer for the Wisconsin Railroad Commission.

Writing in *The Journal of Land & Public Utility Economics*, Mr. Bennett says that extension of natural gas mains and their inter-connection with manufactured gas plants, such as have been announced for portions of Illinois, means large increases in areas served with gas, and "will assist the migration of industries to the smaller communities.

"More and more gas is coming into use with the automatic machine productive equipment, since it is the most easily controlled fuel," he says. "Most industrial processes require heat in some part and, if the present trend toward cheaper gas continues and if a lessening of the cheap fuel supply appears, the most efficient fuel will be used. If this fuel is to be available in the smaller cities, it will be one more factor leading to a healthy decentralization of industry.

"Much gas that could be recovered from coal is now sent out of chimneys of inefficient furnaces. If the demand for gas becomes large enough and if the transmission facilities continue to increase, large gas plants will be located at the mine mouths to remove the gas and by-products from the coal and the remaining coke can be shipped for power generation and other uses We may look even further ahead to the time when the processes for turning coal entirely into gas have become developed sufficiently to allow all coal to be first converted into gas at the mines. This would result in solid fuel becoming as obsolete as candle light."

Hot Water and Health

(Continued from page 351)

thoroughly as a hot tub. I knew a chap who started at the bottom in the paper industry. Every day for a year or so, he toiled at hard labor. Every night, he jumped into a warm tub for five minutes—relaxed—topped off with a cold shower and hit the high spots with his many friends till midnight—enough said.

Mental Relief: It is impossible to separate physical from mental reactions, they are so intimately inter-related. With the increased speed of modern life, humans have come to feel increased pressure, increased need to hurry and rush. There is a wide individual variation in the amount of strain and stress we can stand with out breaking.

Never has there been a time when people needed such careful instructions in the simple methods of relaxation—not during summer vacation—not over a holiday or a week-end alone—but every day in every week.

During and following the market crash many a man and woman also crashed, some from buildings, but most from within themselves. The sanitariums are still carrying an overload of victims—This is an extreme illustration of what is constantly happening to most of us in a small way.

But, why not relax daily under the warm shower or in the warm tub? Why not daily lie down and relax both mind and body, instead of allowing fatigue to accumulate for weeks and months, instead of allowing mental stress and worry to gather momentum over months and years—only to land you in a sanitarium where it will cost you about one hundred dollars a week to take a treatment which has for its chief basis warm water baths—a treatment which you can carry out at home every day of your life for ten or twelve cents?

A Prize-Winning Paper

(Continued from page 346)

and eliminates the necessity of running out into the cold yard to the insanitary garbage can. Furthermore, a gas incinerator is not an expensive luxury!

House heating with gas has now advanced beyond the stage of experiment, to that of practical application. Its cost is only slightly more than heating with coal, and competes very successfully with oil. Besides, a gas furnace will last almost a lifetime, with very little expense, whereas some of the other boilers require replacement in eight years. The convenience of gas house heating is unequaled. No fuel to provide, no ashes, not even a trip to the basement all winter, (unless to the wine-cellar!)—for the gas heater is automatic. Besides, you have a perfectly heated home, always.

It is a well-known fact, conceded by our most distinguished scientists, that the stability of a nation depends primarily on the health of its people. The contribution of gas to the hygienic conditions of our country, is without peer. Better-cooked foods, through the use of gas, are important. An even greater contribution to hygiene and health is the water heater, promoting personal cleanliness. The refrigerator preserves food perfectly, and the gas heating plant provides an even temperature. The gas incinerator quickly and hygienically disposes of all waste that would otherwise breed millions of germs to prey upon an unprotected society. All these factors have brought health and greater happiness to humanity, and at a minimum of effort on the part of the housewife. Truly, no chivalrous knight could have presented to her a gift more royal—than "Gas," for it meant to her aesthetic employment of leisure hours, reclaimed from arduous toil!

Fixes Los Angeles Valuation

GAS properties of the Los Angeles Gas & Electric Corporation have been valued at $72,828,613 by F. E. Defour, valuation engineer of the State Railroad Commission.

Gas Company's Safe Empty

SAFE crackers blew an empty safe in the office of the Ohio Fuel Gas Co., Toledo, O., last month.

Hopkins Offers Innovations in Gas Engineering Course

(Continued from page 345)

gineers in the country, gave a lecture on "Some Engineering Aspects of the Natural Gas Industry." This lecture was attended by the faculty and advanced students of the School of Engineering and by many citizens of Baltimore and vicinity. The lecture was sponsored by the American Gas Association, acting through its Committee on Cooperation with Educational Institutions.

The Gas Engineers Association on April 25, 1930, exhibited an educational film entitled "The Refining of the Crude." This showed the handling of petroleum and was loaned by the United States Bureau of Mines.

The following publications have appeared during the year:

Wilbert J. Huff, "The Cracking of Oil in the Water Gas Machine," *American Gas Journal*, Volume 131, No. 4, p. 47-52, October, 1929;

"The Decomposition of Steam in Water Gas Making," American Gas Association 1929 Convention, Water Gas Committee—Preprint report of Subcommittee on Steam Decomposition, pages 1-4;

"The Origin and Decomposition of Carbon Disulphide in Gas Making. III. Some Chemical and Thermodynamic Effects in the Formation of Organic Sulphur Compounds in Gas Making." Joint paper with John C. Holtz, presented before the Cleveland 1930 Production Conference of the American Gas Association, to be published in the June 1930 number of Industrial and Engineering Chemistry, Volume 22, p. 634 ff.

"Humidity Effects in the Iron Oxide Process for the Removal of Hydrogen Sulphide from Gas." Joint paper with C. Gordon Milbourne. Submitted for presentation at the 1930 Annual Convention of the American Gas Association (Atlantic City, October). (In Press.)

"Instruction and Research in Gas Engineering at Johns Hopkins University." Address before the Southern Gas Association Savannah Convention, 1930. (In Press.)

Lloyd Logan:

"An Experimental Study of the Thermal Conductivity Method for the Determination of Steam Decomposition in Water Gas Making," American Gas Association, 1929 Convention. Preprint report of Subcommittee, pages 4-14.

"A Simple Liquid Flow Indicator," Chem. Met. Eng., Vol. 36 (1929) p. 362.

Professor Huff is a member of the Chemical Committee of the Technical Section of the American Gas Association. This is one of the important committees of the Association and, among other duties, shares joint responsibility for the Annual Production Conference and is in charge of the Gas Chemists' Handbook. During the past year, Professor Huff served on its Advisory Subcommittee and at the Cleveland Conference was recommended by the Committee in session for appointment as Chairman of the Committee for 1930-1931.

Professor Huff also is a member of the Water Gas Committee of the Technical Section of the American Gas Association. During the past year this Committee appointed a special Subcommittee dealing with a research initiated under Professor Huff's direction, namely "Humidity Control in Oxide Purification." Professor Huff served on this Subcommittee and also on a Subcommittee on the Examination and Evaluation of Bituminous Coal for the Water Gas Machine, and on the Subcommittee on Steam Decomposition in the Water Gas Machine.

He also served on the following general committees of the American Gas Association: Committee on Cooperation with Educational Institutions: and the Perry Gas Research Committee.

The development of research under the auspices of the last named committee has been noted above.

Professor Huff is a member of the Gas Reference Committee of the Department of Health of Baltimore City and has served as chairman on a number of subcommittees for the establishment of requirements during the past year.

Professor Logan is a member of the Chemical Committee and a member of the Water Gas Committee, Technical Section, American Gas Association. During the year he served on the Steam Decomposition Subcommittee of the first, and on a subcommittee charged with the revision of a portion of the Gas Chemists' Handbook of the second Committee.

Professor Huff delivered two addresses before members of the technical staff of the Consolidated Gas Electric Light and Power Company of Baltimore. One address was entitled "Corrosion and its Prevention in the Distribution and Utilization of Gas," and the other was entitled "The Chemistry and Thermodynamics of Oil Cracking."

Professor Huff was called in consultation by the Central Public Service Corporation of Chicago on matters relating to oil gas making. He was also called by the Consolidated Gas Electric Light and Power Company of Baltimore on numerous matters relating to gas manufacture and distribution.

The Mars Company, Oil City, Pennsylvania, called him to Western Pennsylvania on natural gas-gasoline problems.

Professor Huff served in consultation as one of the representatives in a national automobile lubricating oil test in which the cars were started from the University of Kansas and directed to various points in the United States.

In addition, professional services were rendered by Professor Huff to the following Baltimore concerns:

C. M. Kemp Manufacturing Company—Carbonizing Problems,

Akme Flue, Inc.—Examination of Flue Device,

Monarch Products Company—Examination of Flue Device.

Professor Huff was, of course, consulted about various research and legal matters developing from the general investigation supported in the Gas Engineering Department by the gas companies of the four large cities above mentioned. These companies are:

The Consolidated Gas Company of New York,

Consolidated Gas Electric Light and Power Company of Baltimore,

The Iroquois Gas Corporation, Buffalo, New York,

The Rochester Gas and Electric Corporation, Rochester, New York.

Professor Huff has been asked to contribute the portion on gaseous fuels in a Chemical Engineering Handbook now being compiled by various experts.

Atlantic City Again to Welcome A. G. A.

(Continued from page 335)

be advisable for all natural gas men to arrive in Atlantic City not later than Monday, October 13. The meeting of the Main Technical and Research Committee has been set for 10 a.m., Monday, October 13. This will be followed by a meeting of the Managing Committee at noon, and at 2 o'clock, the same day, the Natural Gas Department session will be called to order.

While all papers will prove of interest to natural gas men, talks relating particularly to natural gas, which are on the programs of the Accounting, Commercial, Industrial, Publicity and Advertising and Technical Sections, will be so timed that they will not be in conflict with each other. At the general sessions important papers relating to natural gas also will be presented.

At 10:30 a.m., Monday, October 13, an open meeting will be held for the informal discussion of machine systems for general office accounting, and will probably continue throughout the morning and afternoon. All general office accountants as well as representatives of accounting machine manufacturers will be invited to attend the meeting and to take part in the discussion. The equipment described in the reports and other equipment that can be used for the same type of work will be exhibited at the Convention.

A prominent natural gas accountant will present a paper on the accounting problems peculiar to the natural gas industry, and particularly those which would be of interest to both natural and manufactured gas accountants who are faced with the problem of changing from manufactured to natural or mixed gas supply.

Before the Technical Section on Tuesday afternoon, George Wehrle will present a paper, "The Substitution of Natural Gas for Manufactured Gas in Public Utility Operations," which will have particular reference to the experience of the Public Service Company of Colorado. It is expected that this will be followed on Wednesday afternoon with a paper relating to the technical problems involved in the introduction of natural gas on the Pacific Coast.

The Commercial Section will supply two papers of special interest to the natural gas industry—one on "Economics of the Conversion Burner," and the other will be "Developing Natural Gas Sales." A well-known industrial gas engineer is expected to present a paper on "Problems of Sales and Service Encountered in Changeover from Manufactured to Natural Gas." A talk on "Advertising for Natural Gas Development" will be a feature of the Publicity and Advertising Section session.

With the next issue, The A. G. A. MONTHLY expects to be able to publish the complete program in tentative form.

Indications are that about 250 manufacturers of gas appliances will exhibit and demonstrate their products in the big auditorium. This exhibit will be thrown open to the public from 7:30 to 10 o'clock, Monday night, October 13. For the entertainment of those attending, there will be music by a well-known musician on the Auditorium's organ, which is the largest in the world.

The entertainment program is rapidly taking form under the hands of the committee in charge. Three dances are scheduled, Tuesday, Wednesday and Thursday evenings, in the Auditorium ballroom. B. A. Rolfe and his dance orchestra have been engaged to furnish the music.

Among other artists who will take part in the entertainment features will be the Rolfe Orchestra, Jessica Dragonette and "The Cavaliers' Quartet."

A special entertainment feature will take place on Thursday night. Details will be announced later.

The Ladies' luncheon, which will take place on Wednesday at the Sea View Golf Club, promises to be one of the outstanding events of the entertainment of the wives, daughters and guests of members. Following the luncheon there will be bridge for those desiring to play, while all facilities of the club will be open for those who wish to engage in golf, tennis or to take a plunge in the club's big pool, which always is filled with filtered salt water drawn directly from the Atlantic Ocean.

Negotiations are pending looking toward special reduced railroad fares to and from Atlantic City for the benefit of A. G. A. members and their dependents. As soon as these arrangements have been completed, prompt advice will be sent out from Headquarters.

Modern Weathermaking

(Continued from page 340)

A modern system of home weathermaking is a unit placed in the basement like any other central heating plant. The unit is then connected by ducts to air outlets in every room, while the colder air that settles at the floor line is drawn down into the unit through one or more return ducts placed at various points on the first floor. A motor-operated blower circulates and recirculates the air through the house in a continuous cycle. Each time it passes into the unit, it is drawn through filters which take out floating dust particles. It is next passed through sections heated by gas and then moisture is added through contact of the air with a humidifier located at the point where this clean and warmed air is discharged into the ducts which carry it to the rooms above. Gas not only serves to heat the air distributed, but controls and maintains the proper temperature. This fuel also serves to heat and vaporize the water in the humidifier and, by graduating the amount of heat, to supply more or less humidity as conditions require.

In every sense of the word, gas may be said to play a most important part of manufacturing weather in the home. In so doing, it brings a new realization of the value of this fuel to the home owner and at the same time raises the general standard of home heating by creating a new and broader conception of what conditioned air means to health and comfort.

When the homemaker fully realizes this, she too will not only talk about the weather, but will do something about it.

Approves Merger

THE Indiana Public Service Commission has authorized the Southern Indiana Gas and Electric Company to purchase the stock of the Boonville Electric Light and Power Company, and the Newburg Light and Water Company, according to Associated Press dispatches to *The Courier*. The consideration was $516,750.

Monthly Summary of Gas Company Statistics

FOR MONTH OF MAY, 1930

Issued July, 1930, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Statistician

COMPARATIVE STATISTICS OF 148 MANUFACTURED GAS COMPANIES FOR MONTH OF MAY, 1930

	Month of May			Five Months Ending May 31st		
	1930	1929	Per cent Increase	1930	1929	Per cent Increase
Customers	8,900,000	8,723,949	2.0		See May	
Gas Sales (MCF)	30,196,937	30,514,024	— 1.0	159,013,695	155,239,721	2.4
Revenue (Dollars)	32,163,222	32,364,483	— 0.6	166,497,698	163,902,449	1.6
Gas Produced and Purchased (MCF)						
Gas Produced						
(a) Water Gas	15,154,403	16,033,662	— 5.5	84,620,427	88,927,604	— 4.8
(b) Retort Coal Gas	2,529,930	2,631,946	— 3.9	13,169,271	13,401,602	— 1.7
(c) Oil Gas	617,553	562,640	9.8	3,698,323	3,868,770	— 4.4
(d) Coke Oven Gas	4,204,329	3,948,286	6.5	20,273,238	19,061,986	6.4
(e) Reformed Oil Still Gas	141,641	——	—	740,441	——	—
(f) Total Gas Produced	22,647,856	23,176,534	— 2.3	122,501,700	125,259,962	— 2.2
Gas Purchased						
(a) Coke Oven Gas	9,434,665	8,909,089	5.9	47,253,021	41,817,490	13.0
(b) Oil Still and Natural Gas	172,047	204,336	— 5.8	922,362	1,146,246	—19.5
(c) Total Gas Purchased	9,606,712	9,113,425	5.4	48,175,383	42,963,736	12.1
Total Gas Produced and Purchased	32,254,568	32,289,959	— 0.1	170,677,083	168,223,698	1.5

COMPARATIVE STATISTICS OF 90 NATURAL GAS COMPANIES FOR MONTH OF MAY

Customers						
Domestic (Including House Heating)	3,529,626	3,445,031	2.5			
Commercial	170,603	163,093	4.6			
Industrial	10,545	15,138	— 30.3			
Main Line	2,499	1,134	120.4		See May	
Miscellaneous	1,099	1,398	—			
Total (86 companies which segregate)	3,714,372	3,625,794	2.4			
Grand Total (90 companies)	3,733,627	3,643,491	2.5			
Gas Sales (MCF)						
Domestic (Including House Heating)	16,738,499	18,399,629	— 9.0	121,230,396	123,505,277	— 1.8
Commercial	2,043,701	2,166,343	— 5.7	16,161,059	15,529,591	4.1
Industrial	10,621,278	12,518,022	—15.2	56,787,929	61,553,358	— 7.8
Main Line	2,016,788	2,240,438	—10.0	9,451,235	11,148,347	— 1.5
Miscellaneous	82,796	101,546	—	826,165	1,178,503	—
Total (86 companies which segregate)	31,503,062	35,425,978	—11.1	204,456,784	212,915,076	— 4.0
Grand Total (90 companies)	31,672,143	35,573,437	—11.0	205,576,233	213,920,333	— 3.9
Revenue (Dollars)						
Domestic (Including House Heating)	11,782,605	12,573,615	— 6.3	80,103,321	81,287,150	— 1.5
Commercial	1,195,406	1,252,096	— 4.5	8,843,923	8,467,509	4.4
Industrial	3,184,388	3,776,756	—15.7	16,949,557	18,790,999	— 9.8
Main Line	296,093	290,426	1.9	1,378,905	1,532,775	—10.0
Miscellaneous	31,504	45,471	—	449,281	537,925	—
Total (86 companies which segregate)	16,489,996	17,938,364	— 8.1	107,724,987	110,616,358	— 2.6
Grand Total (90 companies)	16,622,953	18,007,943	— 7.7	108,295,125	111,118,305	— 2.5
Gas Produced and Purchased (MCF)						
Natural Gas Produced	11,662,549	12,997,755	—10.3	75,177,090	78,973,806	— 4.8
Natural Gas Purchased	35,207,533	35,983,814	— 2.2	223,673,823	221,400,593	1.0
Natural Gas Produced and Purchased	46,870,082	48,981,569	— 4.3	298,850,913	300,374,399	— 0.5
Manufactured Gas Produced and Purchased	1,804,673	3,500,354	—48.4	12,349,778	20,636,388	—40.2
Total Gas Produced and Purchased	48,674,755	52,481,923	— 7.3	311,200,691	321,010,787	— 3.1
Company Use and Sales to other Gas Companies	14,655,445	15,160,795	—	93,249,682	94,551,222	—
Net Available for Public Distribution	34,019,310	37,321,128	— 8.8	217,951,009	226,459,565	— 3.8

NOTE: Of the ninety reporting companies eighty-six segregate customers, sales and revenue, while four companies report only totals. The data shown for the domestic, commercial-industrial and main line classification are based only on the reports of the eighty-six companies which segregate items.

THE pronounced recession in general business and industrial conditions during May was reflected in the operating statements of gas utilities for the month. Reports from companies representing over 90 per cent of the manufactured gas division of the industry, indicate that gas sales for May aggregated 30,196,937,000 cu.ft., a decline of one per cent from the same month of the preceding year. A group of the larger natural gas utilities, representing over 70 per cent of the public utility distribution of natural gas, report sales of 31,672,143,000 cu.ft. for May, 1930, as compared with 35,573,437,000 cu.ft. sold by these same companies in May, 1929, or a decline of 11 per cent.

Most of the decrease in sales by both branches of the industry was the result of sharp declines in sales of gas for industrial and commercial uses, the natural gas utilities showing a drop of over 15 per cent in industrial gas sales, with corresponding declines in the same class of manufactured gas sales.

While the curtailment in industrial operations during May was wide spread, it was distributed somewhat unevenly among the various major industries, as indicated by a contraction in automobile production of 38 per cent from the corresponding month a year ago, which is obviously greater than the average for all industry, while activity in the steel group was down 24 per cent, iron 17 per cent, cotton 29 per cent and bituminous coal 11 per cent.

New England was one of the few regions to report any substantial progress during May, manufactured gas sales in that section showing a gain of three per cent. Sales of gas for domestic or household uses were up nearly five per cent, but this was somewhat offset by a decline of 10 per cent in industrial-commercial sales. In Massachusetts total sales registered a gain of nearly five per cent, in spite of a decline of 12 per cent in industrial-commercial sales.

The Middle Atlantic States registered a sales decline of 1.2 per cent from May, 1929, the decrease in New Jersey and Pennsylvania averaging about one per cent, and in New York about 1.5 per cent.

In the East North Central States total sales of manufactured gas were down three per cent, while the decline in industrial-commercial sales amounted to nearly 10 per cent. The loss in industrial-commercial sales was distributed somewhat unevenly throughout this region, as Illinois and Wisconsin showed declines of only 5 and 7 per cent respectively in this class of business, but in Indiana the decrease exceeded 13 per cent, while Michigan reported a drop of more than 16 per cent in industrial-commercial sales for the month.

GROUP A—NEW ENGLAND STATES

(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.)

(Data reported by 36 companies whose sales constitute 83% of the total sales of manufactured gas in the New England States.)

	Month of May			*Five Months Ending May 31st*		
Customers	*1930*	*1929*	*Per cent Increase*	*1930*	*1929*	*Per cent Increase*
Domestic	1,050,397	1,044,637	0.6			
House Heating	5,689	4,122	38.0			
Industrial and Commercial	37,415	38,551	— 3.0		*See May*	
Miscellaneous	378	217	—			
Total (35 companies which segregate)	1,093,879	1,087,527	0.6			
Grand Total (36 companies)	1,127,660	1,120,944	0.6			
Gas Sales (MCF)						
Domestic	2,294,028	2,188,162	4.8	10,927,159	10,477,496	4.3
House Heating	179,756	137,473	30.8	1,963,326	1,433,711	36.9
Industrial and Commercial	538,120	597,547	—10.0	2,837,523	3,051,926	— 7.0
Miscellaneous	20,907	21,379	—	136,296	136,901	—
Total (35 companies which segregate)	3,032,811	2,944,561	3.0	15,864,304	15,100,034	5.1
Grand Total (36 companies)	3,119,905	3,029,785	3.0	16,330,225	15,536,188	5.1
Revenue (Dollars)						
Domestic	2,984,725	2,855,140	4.5	14,236,753	13,682,333	4.1
House Heating	150,305	105,923	41.9	1,592,030	1,154,396	37.9
Industrial and Commercial	512,899	602,378	—14.9	2,694,338	3,096,100	—13.0
Miscellaneous	15,980	18,942	—	89,437	105,236	—
Total (35 companies which segregate)	3,663,909	3,582,383	2.3	18,612,558	18,038,065	3.2
Grand Total (36 companies)	3,763,773	3,679,596	2.3	19,120,790	18,525,113	3.2
Gas Produced and Purchased (MCF)						
Gas Produced						
(a) Water Gas	1,625,578	1,462,884	11.1	7,910,016	7,639,476	3.5
(b) Retort Coal Gas	655,682	713,554	— 8.1	3,805,969	3,656,604	4.1
(c) Oil Gas	——	——	—	438	——	—
(d) Coke Oven Gas	363,085	312,863	16.1	1,838,065	1,476,844	24.5
(e) Total Gas Produced	2,644,345	2,489,301	6.2	13,554,488	12,772,924	6.1
Coke Oven Gas Purchased	729,272	718,165	1.5	3,673,559	3,501,470	4.9
Total Gas Produced and Purchased	3,373,617	3,207,466	5.2	17,228,047	16,274,394	5.9

NOTE: Of the thirty-six companies reporting, thirty-five segregate customers, sales and revenue monthly, and one reports only totals. The data shown above for domestic, house heating, industrial-commercial classifications are based on the reports of the thirty-five companies which segregate returns.

Associations Affiliated with A. G. A.

Canadian Gas Association
Pres.—A. T. Leavitt, Hamilton By-Product Coke Ovens, Ltd., Hamilton, Ont.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

Colorado Utilities Association
Pres.—H. S. Robertson, Denver Tramway Corp., Denver, Colo.
Sec.-Tr.—O. A. Weller, Public Service Co. of Colo., Denver, Colo.

Empire State Gas and Electric Association
Pres.—William J. Welsh, New York & Richmond Gas Co., Staten Island, New York.
Chairman Gas Section—M. F. Clement, Rockland Light & Power Co., Middletown, Ind.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.

Illinois Gas Association
Pres.—H. T. East, Public Service Company of Northern Illinois, Chicago, Ill.
Sec.-Tr.—George Schwaner, 305 Illinois Mine Workers Bldg., Springfield, Ill.

Indiana Gas Association
Pres.—C. L. Kirk, Citizens Gas Co., Indianapolis, Ind.
Sec.-Tr.—F. W. Budd, Central Indiana Gas Co., Muncie, Ind.

Michigan Gas Association
Pres.—Prof. A. H. White, University of Michigan, Ann Arbor, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.

Mid-West Gas Association
Pres.—J. M. Drabelle, Iowa Ry. & Lt. Corp., Cedar Rapids, Iowa.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

Missouri Association of Public Utilities
Pres.—H. M. Patton, Union Electric Light & Power Co., St. Louis, Mo.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Asst. Sec.—Jesse Blythe, 103 West High St., Jefferson City, Mo.

New England Gas Association
Pres.—H. Vittinghoff, Stone & Webster, Inc., Boston, Mass.
Exec. Sec.—C. D. Williams, 41 Mount Vernon St., Boston, Mass.
Chairman Operating Div.—A. S. Hall, Springfield Gas Light Co., Springfield, Mass.
Secretary Operating Division—Paul Buchanan, Hartford Gas Co., Hartford, Conn.
Chairman Sales Div.—J. H. Sumner, Cambridge Gas Light Co., Cambridge, Mass.
Sec.-Tr. Sales Div.—A. M. Slattery, Hoffman Heater Co., Boston, Mass.
Chairman Industrial Div.—L. E. Wagner, Providence Gas Co., Providence, R. I.
Sec.-Tr.—Industrial Div.—Charles S. Hilton, Pawtucket Gas Co., Pawtucket, R. I.
Chairman Acctg. Div.—Burton Smart, Portland Gas Light Co., Portland, Me.
Sec.-Treas. Acctg. Div.—Otto Price, Boston Consolidated Gas Co., Boston, Mass.
Chairman Manufacturer Div.—J. D. Taylor, Walker & Pratt Mfg. Co., Boston, Mass.
Sec.-Treas. Manufacturers Div.—J. H. McPherson, 250 Stuart St., Boston, Mass.

New Jersey Gas Association
Pres.—Chester Grey, Atlantic City Gas Company, Atlantic City, N. J.
Sec.-Tr.—H. E. Cliff, Public Service Electric & Gas Co., Newark, N. J.

Ohio Gas and Oil Men's Association
Pres.—L. K. Langdon, Union Gas & Electric Co., Cincinnati, Ohio.
Sec.-Tr.—Wm. H. Thompson, 811 First National Bank Bldg., Columbus, Ohio.

Oklahoma Utilities Association
Pres.—T. H. Steffens, Sand Springs Railway Co., Sand Springs, Okla.
Mgr.—E. F. McKay, 1020 Petroleum Bldg., Oklahoma City, Okla.

Pacific Coast Gas Association
Pres.—F. H. Bivens, Southern Counties Gas Co., Los Angeles, Calif.
Mang. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

Pennsylvania Gas Association
Pres.—E. G. Boyer, Philadelphia Electric Co., Philadelphia, Pa.
Sec.-Tr.—Frank W. Lesley, Pennsylvania Gas & Electric Co., York, Pa.

Pennsylvania Natural Gas Men's Association
Pres.—George E. Welker, United Natural Gas Co., Oil City, Pa.
Sec.-Tr.—B. H. Smyers, Jr., 435 Sixth Ave., Pittsburgh, Pa.

Southern Gas Association
Pres.—A. J. Goss, Chattanooga Gas Co., Chattanooga, Tenn.
Sec.-Tr.—G. H. Schlatter, Birmingham Gas Co., Birmingham, Ala.

Southwestern Public Service Association
Pres.—Knox Lee, Southwestern Gas & Electric Co., Marshall, Texas.
Chairman Gas Section—Frank L. Chase, Lone Star Gas Co., Dallas, Texas.
Sec.—E. N. Willis, c/o University Club, Dallas, Texas.

The Public Utilities Association of Virginia
Pres.—C. B. Short, Roanoke Railway and Electric Co., Roanoke, Va.
Sec.— C. O. Robertson, P. O. Box 537, Roanoke, Va.

Wisconsin Utilities Association
Pres.—M. H. Frank, Wisconsin Power & Light Co., Madison, Wis.
Exec. Sec.—J. N. Cadby, 105 Wells St., Milwaukee, Wis.

Twelfth Annual Convention of the American Gas Association
Atlantic City, N. J. - - - October 13-17, 1930

Employment Bureau

SERVICES REQUIRED

Experienced industrial gas salesmen for large operating gas company. **0163.**

Salesmen to sell gas to industries. Experienced men preferred. **0164.**

Sales engineers to handle line of motor operated valves, low temperature pressure and combustion safety controllers. Men 25 to 35 years with college training preferred. Familiarity with process control field advantageous. **0167.**

Industrial gas sales engineers by Public Utility in Middle West. College graduates in engineering courses preferred. Please state age, experience, education, and salary expected. **0169.**

One, two or three salesmen familiar with househeating; would like to interview those who have held similar positions with gas companies. Salary according to experience and ability. **0171.**

Experienced gas appliance salesmen wanted by Holding Company for service in small gas plants. Only men who can sell and are ambitious are desired. Salary and commission. Write full qualifications. **0172.**

Young engineer to supervise servicing of heating boilers, gas refrigerators, water heaters and similar appliances; a technical man who can learn the practical end or who is already familiar with it, and who also will understand the theory of the gas refrigerator, etc. **0173.**

Rate specialist with accounting, legal and engineering knowledge. Experience and good personality essential; position requires traveling; salary commensurate with qualifications. Include references with application. **0174.**

Experienced house-heating sales engineer. State age and qualifications. Location: Kentucky and Tennessee. New natural gas territory. State salary and commission desired. **0175.**

Experienced gas appliance salesman. State age and qualifications. Location: Kentucky and Tennessee. New Natural gas territory. State salary and commission desired. **0176.**

Manager for small gas property in the Southeast owned by holding company. State experience, references, and salary desired. **0177.**

High grade man with adequate education and experience to take charge of relatively large property; position is chiefly managerial but requires good engineering background. **0178.**

SERVICES OFFERED

Manager-Engineer, technical man, nineteen years experience in coal and water gas operation, distribution, city and industrial plant design and construction; familiar with recent developments in production and modification of gases; now employed, desires change. **329.**

Technical and practical gas engineer now employed as manager of small property desires a position as production engineer over a group of properties. Capable of putting gas production and boiler plants on a money saving basis. **330.**

Experienced sales engineer specializing in design and sale of carbonization and auxiliary plant equipment. Good organizer, with analytical ability and wide acquaintance in Canada and United States. **332.**

Gas engineer having wide experience in all departments of business, construction, manufacturing, distribution, sales and appraisal —also knowledge of the sale and handling of by-products, and having executive experience desires connection as manager or superintendent or as engineer with holding company. Could handle combination gas and electric company. Can furnish best of references. **333.**

ARE YOU READING THESE ADVERTISEMENTS?

Mr. Employer and Mr. Employee, you are both in an industry where the personnel turnover in individual cases is relatively small and infrequent. Nevertheless, there is a constant and steady change and many men are in demand. Do you read each other's advertisements?

The A. G. A. maintains a confidential service for securing qualified executives, engineers, operators, and salesmen. A privilege of membership is the insertion (without charge) of an advertisement by those seeking such positions.

Mail copy for receipt by the seventh of the month to ensure insertion in the next issue.

Typewrite letters and qualification record if possible.

Industrial and househeating engineer with nineteen years experience in the natural gas industry; capable of compiling manuals and organizing departments with proven results; desires position as such, or manager of small property. **334.**

Technical man, age 34, married. Eleven years experience in laboratory and plant control of coal and water gas manufacture. Open for position as chemist, assistant to superintendent or foreman. **335.**

Chemical Engineer with Master's degree, experienced research man in engineering and public utility problems, desires summer employment. **337.**

Chemical engineer with eight years' experience with large public utilities on gas plant operation, and design of gas and power plant equipment. Experienced in handling men. Desires place as assistant to executive, or industrial sales. Would consider service and sales with equipment manufacturer. Married and now employed. Can leave on short notice. **338.**

A young executive with several years' experience in rates, sales promotion, advertising and public relations work is now available. **339.**

Engineer, M.S. degree, 10 years' experience in coal processing and allied problems. Particular experience in technical and economic phases of low-temperature carbonization and complete gasification. **340.**

Gas Engineer—college education, with nine years' experience in transmission and distribution of manufactured and natural gas. **341.**

Gas sales engineer of broad experience in industrial and househeating fields. Age 33, married. Capable of developing new fields, conducting surveys, and designing equipment for special heating processes; familiar with domestic appliances. Desires position as manager of department or assistant to executive. **342.**

Meter shop superintendent with thorough knowledge of all types of meters; can produce results without disorganizing other personnel and offers best of references. **344.**

Engineer—technical graduate with twelve years' experience as cadet engineer, plant foreman, manager and engineer desires new connection—40 years of age, married. **345.**

Successful industrial engineer of several years broad experience; also technically trained in production and distribution; college graduate. **346.**

1928 Graduate with degree of M.E. desires position as assistant to engineer or minor executive of gas company, or company manufacturing gas apparatus. **348.**

New Business or Merchandise Manager, 38 years of age, desires connection with a gas or combination utility. Ten years of highly diversified experience in utility commercial efforts covering general merchandise sales promotion, advertising and publicity, commercial accounting methods, new business promotion, etc. **349.**

Eastern Sales Manager or Sales Representative of gas appliances of merit and reasonable demand. Due to many years in the business I have a large circle of acquaintances who would assist me in forming contacts. **350.**

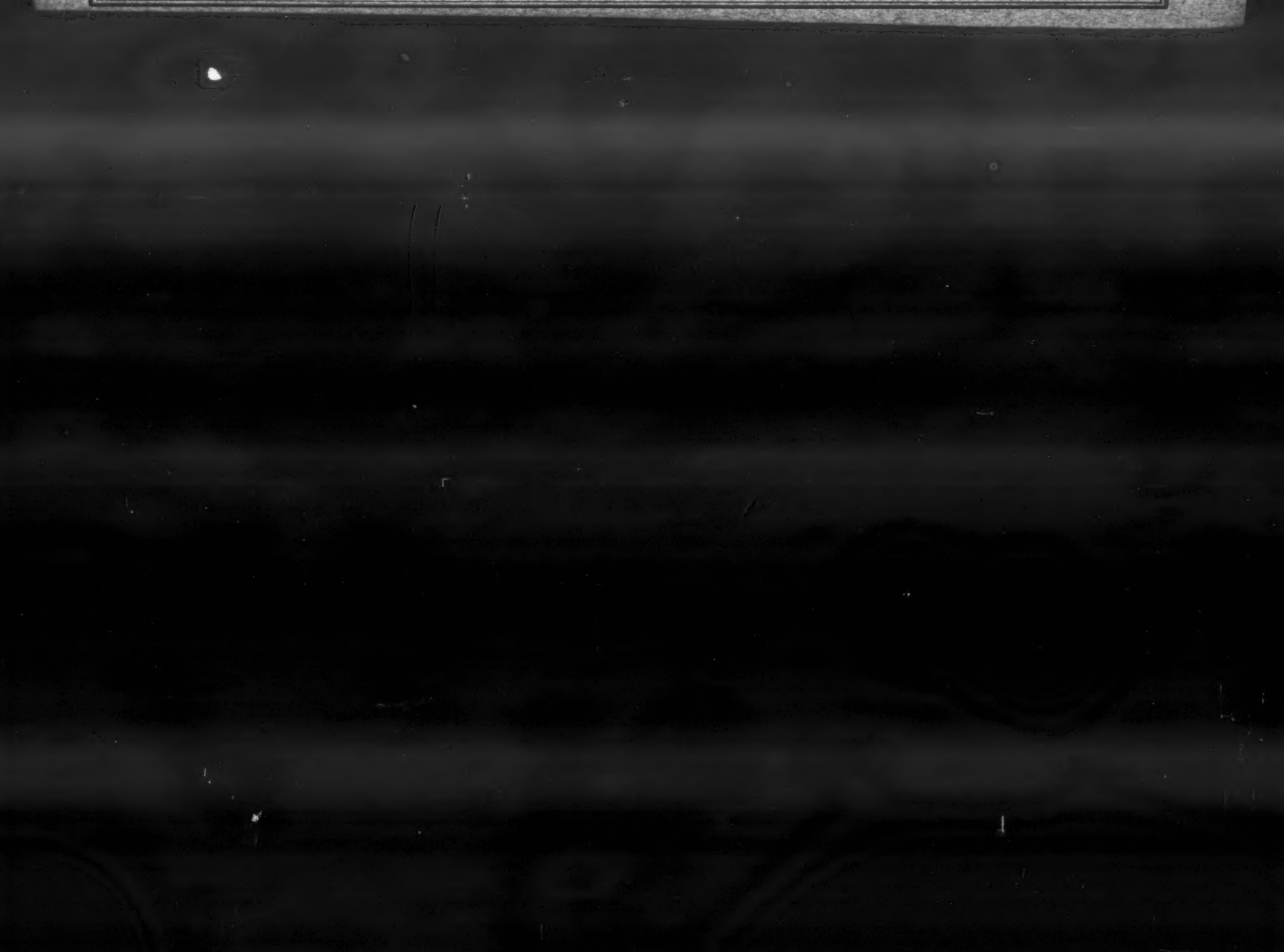
Engineer thoroughly trained in construction, appraisal, depreciation, gasoline absorption and research studies, desires connection where advancement will be earned by productive efforts. Twelve years productive service and experience. **351.**

Young lady desires change; experienced secretarial worker in public utility field. Familiar with gas office and show room routine and cashier's duties. Excellent references. **352.**

Practical distribution and complaint man experienced in the installation and servicing of domestic, commercial, and industrial equipment. Would consider foreign service; speaks German. **353.**

Industrial gas engineer now with company operating in several cities, desires change; competitive fuels experience. **354.**

Accountant, 28, college education. Four years experience in keeping general office books for companies engaged in pipe-line construction, and the transmission and distribution of natural gas. Can furnish best of references. Employed at present. Prefers West or Middle West location. **355.**



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